

Brain control by radio

Tape instant home movies for your TV

POPULAR MECHANICS

NOV. 1965
35 CENTS



PM's Suburba-car contest!

DESIGN A BODY—WIN THIS CHASSIS!

PLYFOAM: Exclusive first report!

NOW! BUILD ANYTHING IN FIBERGLASS!

If you must use a circular saw—
FOR SAFETY'S SAKE—
Use the BEST!



A bargain saw may not be a safe buy!

New Wen Stallions were created with superior safety factors as a primary objective. Stability, necessarily a part of safety, results partly from front end adjustments that permit the saw to be tilted toward the rear. Your hand is always behind the blade for better cutting control. Heavy cast aluminum depth quadrants plus extra rigid steel angle quadrants assure stability at any depth or angle of cut.

Perfect balance means safety, too. With it you're never "fighting" the saw—no matter what the depth or angle of cut. And the Stallions' low profile indicates its low center of gravity. This, plus the full contour, one-piece handle, keeps the proper down/forward ratio of cutting force behind the blade shaft at all times. This special design aid contributes greatly to precision cutting and safety.

Precision engineering inside and out—heavy duty bearings, high efficiency motors, rigidly braced shoe plates, ZERO

depth and angle adjustments, blades of higher quality than are normally found—all these make major contributions to operator safety.

Other built-in safety features are anti-kickback clutch, sawdust ejector, powerful blower clears line of cut, and a heavy-duty cord that stays clear of the saw blade and work.

Your choice of a 12 amp—2½ H.P. motor; or a 10 amp 1½ H.P. motor. All Wen tools are U.L. and C.S.A. listed.

Ask your dealer about the price — you'll be pleasantly surprised.



WEN MIGHTY STALLION
 7 1/4" CIRCULAR SAW

WEN



100% AMERICAN MADE

PRODUCTS, INC.

5810 Northwest Highway • Chicago, Illinois 60631



Here's how you can trim time and shorten steps (with a handy tool for every shop)

Equip yourself with an extension telephone near your workbench.

When calls come in, reach—don't run.

Ordering materials? Do it on the spot where you can spot what you need.

And if you don't object to being a household hero, here's an idea: Share the telephone convenience.

Find a spot for your extension where the

family can use it too. Near your bench and near the laundry room or game room, for instance.

Remember, an extension phone really gives you your money's worth. It costs only a fraction of the monthly cost of your first phone.

Get one fast. Just call our Business Office or ask your telephone man.



Bell System

American Telephone and Telegraph
and Associated Companies



Dan Gurney, Grand Prix driver and three-time winner of the Riverside 500, tells you

**"How to improve
your car's
performance
without raising
the hood..."**

Blow out your engine on a fast stretch of highway . . . it helps get rid of carbon in the combustion chamber and cleans plugs of deposits that result from slow driving and idling. But take care. Lead deposits that form on plug insulators become conductive if heated rapidly, shorting plugs and causing misfiring. What's more, the deposits may become so badly

fused that you can't remove them even by cleaning. Then it's "good-bye," plugs!

So don't just stand on it all of a sudden. Accelerate slowly. And stay within safe, legal limits. With today's "long" axle ratios that let big V8 engines loaf along, you might have to run in an intermediate gear to get the cleaning job done.

Power Tip plugs, pioneered by Autolite, all but eliminate the spark plug problem. Autolite Power Tip plugs have long insulator tips and electrodes that extend further into combustion chambers. The result is that swirling gases and higher tip temperatures keep Autolites freer of deposits—keep power and economy at a peak longer.

AUTOLITE
A PRODUCT OF *Ford*

Place your face here and go 'Z-Z-Z-Z-Z-Z-Z.'



NOW YOU KNOW HOW IT FEELS TO SHAVE WITH AN ELECTRIC SHAVER THAT SHAVES 18% CLOSER THAN ANY OTHER.

You didn't feel anything? Good. Now you know how it feels to shave with the new Norelco Speedshaver®. What you won't know until you try it is just how close a shave you get. Actually 18% closer because we've shaved down our shaving heads 18% thinner . . . as thin as this sheet of paper. Behind them, Norelco rotary blades gently stroke off whiskers without cutting. Or nick-

ing. Or grabbing or pulling. There's a pop-up trimmer for sideburns. "Floating Heads" that fit every contour of your face. Easy "flip-open" cleaning. A voltage selector. On/off switch. And a coil cord. All in all, more shaving features than any other electric shaver. Hurry out and buy one before you have to explain what you're doing holding a magazine to your face and going Z-Z-Z-Z-Z.



Great first shaver.
The new Norelco
'Flip-Top' Speedshaver.
Now in bright maroon.



Perfect second shaver.
Now at a new low price.
The Norelco Cordless
with drawstring pouch.

Norelco®

The Close Electric Shave

©1965 North American Philips Company, Inc., 100 East 42nd Street, New York, New York 10017

Other products: Electric Housewares, Hearing Aids, Radios, Tape Recorders, Dictating Machines, Electronic Educational Kits, Medical X-ray Equipment, Electronic Tubes and Devices.

POPULAR MECHANICS

PM SPECIALS THIS MONTH!

- 146 PLYFOAM: FABULOUS NEW WORKSHOP WONDER**
Revolutionary material makes easy forms for fiberglass
- 84 MISSING LINK IN TRANSPORTATION**
Parading a new concept in cars to cure our traffic headache
- 88 WIN THE SUBURBA-CAR CHASSIS ON THE COVER**
Design a body for your own "missing link" and win the frame
- 92 HOME MOVIES FOR YOUR TV**
Now you can tape them at home for instant replay

FEATURES OF SPECIAL INTEREST

- 96** How Many Beans in the Jar?
- 100** New Deal for the Harried Commuter
- 106** Whatever Became of the Village Blacksmith?
- 108** Rattle Up a Deer This Year
- 110** Hot New Ideas in Home Heaters
- 116** Three Giant Steps to the Moon, Part 2
- 122** Sub-minis: Those Mighty Midget Cameras
- 128** Bottoms Up Down Under
- 130** Brain Control by Radio
- 134** Burning a Memorial into a Mountain
- 138** Life That's Made to Order

FOR THE SHOP CRAFTSMAN

- 146** Plyfoam Projects
- 156** Bird Automat
- 158** Is Your Run-Off System Doing Its Job?
- 166** Swing-Out Sewing Caddy
- 172** Pattern Your Shotgun
- 176** Motorized Humidifier for Your Furnace
- 182** What to Do After an Auto Tuneup
- 188** Offbeat Tricks with Your Radial Saw
- 194** Make Your Own Hand-Screws
- 198** Don't Let Electrical Problems Stop Your Car

REGULAR DEPARTMENTS

- | | |
|----------------------------------|----------------------------------|
| 8 Letters to the Editor | 54 Inventor's Show |
| 16 News from the Military | 60 Detroit Listening Post |
| 20 Science Worldwide | 83 Editor's Page |
| 24 New Inventions | 144 New for Your Home |
| 30 What's New Outdoors | 168 Solving Home Problems |
| 36 Aviation Jetstream | 171 Camera Buffs |
| 43 New Products | 186 Automobile Clinic |
| 44 Career Barometer | 202 New in Electronics |
| 50 Spotlight on the Honda | 234 Homeowners' Clinic |

INTERNATIONAL EDITIONS: AUSTRALIAN, SPANISH, CARIBBEAN,
FRENCH, DUTCH, PORTUGUESE, DANISH, SWEDISH

Published By The Hearst Corporation
RICHARD E. BERLIN, PRESIDENT

President, Mag. Division:
RICHARD E. DEEMS

Publisher:
JOSEPH F. KERN

Editorial Director:
WALTER IAN FISCHMAN

Executive Editor:
RICHARD F. DEMPEWOLFF

Managing Editor:
JOHN A. LINKLETTER

Shop Crafts Managing Editor:
WAYNE C. LECKEY

Art Director:
RAYMOND A. SCHULZE

CLIFFORD B. HICKS	Midwest Editor
THOMAS E. STIMSON	Western Editor
KEVIN V. BROWN	Aviation
ALFRED W. LEES	Home Workshop
RICHARD HOWE	Building and Landscape
ARTHUR MIKESSELL	Boating
JOHN F. PEARSON	Science
STUART JAMES	Outdoors
LARRY STECKLER	Electronics
ALEX MARKOVICH	New York Automotive
JIM DUNNE	Detroit Automotive
ROBERT B. BERGER	Photography
FRANK X. SMITH	Production
MURRAY COOPER	Assistant Art Director
LEO R. WEEKS	Assistant Art Director
FRANK P. FRITZ	Chief Photographer
EUGENE A. COLANGELO	Staff Photographer
RALPH L. CLAAR	Photographer
GARRY WINTER	PM Books
FRANKLYN JACOBY, ASID/IDI	Design Consultant
EVERETT JOHNSON	Cabinetmaker

ADDRESS COMMUNICATIONS TO: 575 Lexington Ave., New York, N.Y. 10022. For additional sources of information on the articles and products in this issue, write to Bureau of Information, Popular Mechanics, for free "Where-to-Find-It" list.

L. PARK BENJAMIN, Advertising Director

ADVERTISING OFFICES: New York: 575 Lexington Ave., Murray Hill 8-8500; Chicago: 520 N. Michigan Ave., 527-2400; Detroit: General Motors Bldg., TRinity 5-8711; Cleveland: Hanna Bldg., 1422 Euclid Ave., PRospect 1-0456; Los Angeles: 3460 Wilshire Blvd., DUinkirk 2-8458; San Francisco: 1101 Hearst Bldg., YUkon 2-0823.

SUBSCRIPTION SERVICE: Mail all subscription orders, changes of address, correspondence concerning subscriptions, and Postmaster notices of undeliverable copies to Popular Mechanics, 250 West 55th St., New York, N.Y. 10019.

Popular Mechanics is published monthly by The Hearst Corporation, 57th St. at 8th Ave., New York, N.Y. 10019, U.S.A. Richard E. Berlin, President; George Hearst, V-Pres.; Richard E. Deems, President of Magazines; John R. Miller, V-Pres. and Gen. Mgr. of Magazines; G. Harry Chamberlaine, V-Pres. for Research and Marketing; William S. Campbell, V-Pres. and Director of Circulation; Joseph F. Kern, V-Pres. for Popular Mechanics; Frank Massi, Treasurer; R. F. McCauley, Secy. Single copy in the United States and Canada, 35 cents. Subscription prices: United States and Possessions, \$4.00 for one year; \$7.00 for two years; \$10.00 for three years. Canada, add \$0.50 for each year. Pan American Postal Union countries, add \$1.00 for each year. All other countries, add \$2.00 for each year. When changing address, give old address as well as the new, with postal-zone number, if any, and allow six weeks for change to become effective. Second-class postage paid at New York, N.Y., and at additional mailing offices. Authorized as second class mail by the Post Office Department, Ottawa, and for payment of postage in cash. Registered as second-class matter at the Post Office at Mexico, D.F., Mexico, June 20, 1950. ©1965 by The Hearst Corporation. All rights reserved. Printed in U.S.A.



If you care about your car
don't accept just any motor oil,
insist on...



THE
**UNCOMMON
MOTOR OIL**

100% PURE PENNSYLVANIA

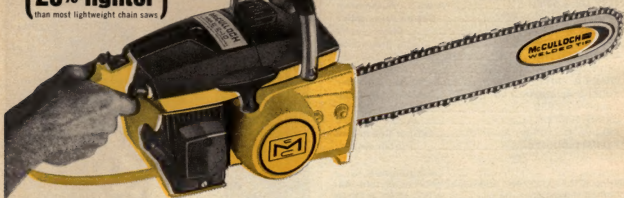
Better from the ground up!

WOLF'S HEAD OIL REFINING CO.
OIL CITY, PA.

PULPING • PROFITS • TRIMMING TREES • CLEARING LAND •
 T • BUILDING A CABIN • PRUNING ORCHARDS
 CES • CUTTING FIREWOOD • BUILDING A
 G OUTDOOR FURNITURE • BLAZING A TRAIL

**On July 1, 1965,
 the new McCulloch MAC-10
 Series made every other
 lightweight chain saw
 overweight and
 out-of-date**

(25% lighter)
 than most lightweight chain saws



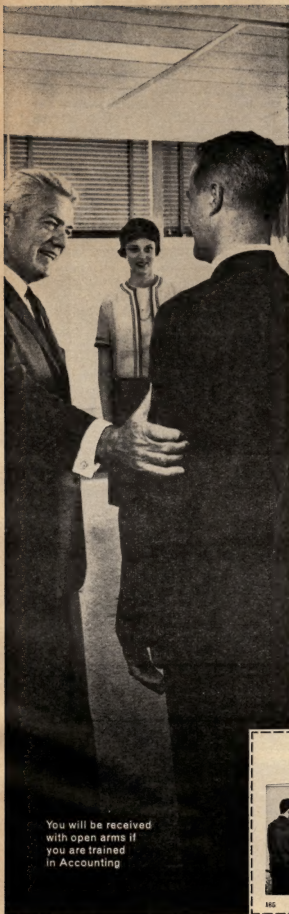
MAC 1-10: The world's lightest direct drive chain saw. 10½ lbs.*
MAC 2-10: World's lightest automatic oiling chain saw. 10¾ lbs.*

If you know you need a chain saw to do any of the hundreds of wood cutting jobs one can do, now's the time to act. And if you've never thought about owning a chain saw, it's time to find out how handy a new, fast-cutting MAC-10 Series chain saw is to have around. The MAC-10 Series saws are up to one-quarter lighter than other lightweights, but have features and advantages that you'd expect only on much heavier saws. Larger capacity fuel and oil tanks, for instance, that keep MAC-10's running for a full half hour or even longer. A new, exclusive idle-governor that prevents stalling, and a fingertip primer that makes fast, sure starts. Extra strong internal parts, for long, dependable life. And, of course, the McCulloch trademark that is your guarantee of the best chain saw you can buy, any size, any price, for any job. Let your McCulloch Dealer show you the MAC-10's now. Or write for your full color McCulloch chain saw catalog: McCulloch Corp., Dept. PM, 6101 West Century Blvd., Los Angeles, California 90045.

Prices and specifications subject to change without notice or obligation.

*Engine weight only, dry, less bar and chain.

MCCULLOCH 
CHAIN SAWS • OUTBOARDS
LEADERSHIP THROUGH CREATIVE ENGINEERING



You will be received
with open arms if
you are trained
in Accounting

Stop worrying about security
for the rest of your life!

Be a trained Accountant

Learn in your spare time at home. You'll be welcomed into a high-pay field where there are more jobs than there are people to fill them.

THE demand for trained Accountants far exceeds the supply. Salaries keep going higher, promotions come faster. Many Accounting-trained men are being moved up to important management positions. Why remain in a job with an uncertain future when you can earn such big rewards in money, prestige and assured security?

You can take LaSalle Accounting training at home, in your spare hours, without any previous bookkeeping experience. LaSalle's distinguished faculty starts you at the beginning; explains every basic Accounting principle and method; gives you actual Accounting problems with your lessons, then corrects and grades your work; shows you exactly how accountants on the job handle these problems. Your training is complete, practical and enjoyable. You are thoroughly prepared for the Accounting tasks you will be expected to handle on the job.

Your career could not be in more experienced hands. For over half a century, LaSalle has been a world leader in business training, with over 1,000,000 students enrolled. A LaSalle diploma in Accounting is a credential respected by employers.

Send for free booklet and sample lesson

If you are truly seeking a more rewarding job, with higher pay, a solid position in the business world and all the good things that come with success, you owe it to yourself to read LaSalle's famous booklet "Opportunities in Accounting." With it you will receive a free sample lesson in Accounting which will demonstrate how LaSalle makes home study easy, interesting and thoroughly practical. Mail coupon to LaSalle, 417 S. Dearborn, Chicago, Illinois 60605.

LA SALLE EXTENSION UNIVERSITY

A Correspondence Institution

417 S. Dearborn, Dept. 47-051, Chicago, Illinois 60605



Please mail me, free of cost or obligation, your illustrated booklet "Opportunities in Accounting" and also your sample lesson.

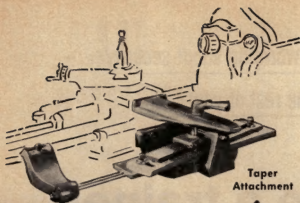
Name.....Age.....

Address.....County.....

City & State.....Zip No.....

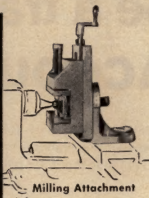
Occupation.....Working Hours.....A.M.....P.M.

MS



Taper Attachment

Get
More Work
out of
Your Lathe



Milling Attachment



Steady Rest



External Grinder



Live Centers



Handle Lever Collet Attachment

Use South Bend® Attachments to...

Cut Machining Time • Simplify Difficult Jobs
Speed up Tooling • Handle More Types
of Jobs • Perform Non-lathe Operations

Write for complete information
on the largest selection of lathe attachments,
tools and accessories made.

SOUTH BEND LATHE

South Bend Lathe, Inc., South Bend 22, Indiana

Builders of Lathes, Milling Machines,
Shapers, Drill Presses.

Up to 36 months to pay



LETTERS TO THE EDITOR

Brakeless Stopper

In *Fast-Reflex School for Patrolmen* (page 96, August PM), the author said that one of the fastest ways to stop a car when the brakes fail is to pull it off the road.

Due to an unfortunate action of mine, I found a quicker way to stop: Simply shift into reverse. You may end up with a ruined transmission, but, as you said, it's better than a busted skull.

Justice, Ill.

LAWRENCE GESTAUT

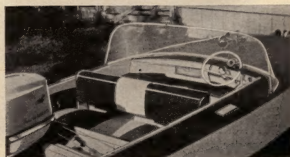
We didn't try it, but our New York auto editor, Alex Markovich, checked out the technique with an engineer. His verdict: It works, and it won't necessarily ruin an automatic transmission. However, with a manual box, chances are you wouldn't be able to get into reverse at speed.

A Thrill to Hit the Throttle

The frame of our *Hydro Dynamic* (page 144, March 1963 PM) was constructed of mahogany and covered with the best non-marine plywood we could obtain. We strengthened and modified the transom to handle our 75-hp motor.

The entire hull is fibreglassed and finished inside and out with red and white epoxy marine paint. The seats are full-width spring-cushioned auto seats from the rear of two Ramblers.

With a standard prop, 12 gallons of fuel (Please turn to page 10)





TOM McCAHILL ADVISES SATURDAY MECHANICS

If you're a Saturday mechanic, my guess is you can fix the screen door, build lawn furniture, overhaul the kid's bike, and rotate your own tires.

It's a different story when that fancy electric coffeemaker stops perking or the push-button automatic washer quits halfway through a cycle. You might spend an afternoon admiring the coffeemaker's innards before giving it a permanent vacation on the top kitchen shelf.

As for the automatic washer, after the Little Lady shouts "Do something!" you'll end up phoning an Appliance Serviceman across town. He shows up in 3 days and has the washer going in one-fourth the time it took you to study the coffeemaker. He also presents you with a ticket for 30 bucks. When you consider he could make twice that selling you a new machine, you got off easy.

Maybe you never realized it, friend, but you have more Appliances around your hacienda today than you did five years ago. If you count power tools, your wife's hair dryer, an air conditioner, plus the standard stuff like vacuum cleaner, toaster, refrigerator, freezer and so forth, you probably have well over a dozen.

These electrical gadgets nowadays represent a pretty good chunk of your hard earned dollars. Did you ever stop to think it could pay you in savings and convenience to know how to fix these things? Also, it could be a great source of extra income if you're inclined to tackle the few thousand broken Appliances right in your own neighborhood.

The Appliance Repair business is easier to learn than you imagine. The National Radio Institute's Appliance Division has a downright interesting, low cost course you can take in your spare time. It covers every type of Appliance you can think of plus air conditioning, refrigeration, house wiring, electric motors—even small gas engines. There's a worthwhile section on farm and commercial appliances too.

NRI starts you with the basic principles of electricity to give you a solid background. Using clear-cut picture diagrams, they show you how various types of Appliances work, separating each into groups. Included with the course is a topnotch, professional Appliance Tester for fast troubleshooting.

Easy to read, bite-size lessons are loaded with photos and cutaway drawings so you see how each Appliance comes apart, and more important—goes back together in working order.

Whether or not you agree that knowing Appliance Repair could help you, I recommend you see for yourself. The little coupon below will get you a free book that fully describes this unique home training. It also brings a free sample lesson. No salesman is going to call.

Do yourself a favor and mail the coupon today.

Tom McCahill

TOM McCAHILL

APPLIANCE DIVISION, NATIONAL RADIO INSTITUTE
3939 Wisconsin Avenue, Washington, D. C. 20016

600-115

OK—I want to see for myself. Send me the free book on Professional Appliance Servicing and a free sample textbook. No salesman.

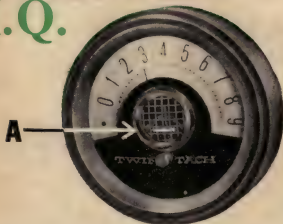
Name..... Age.....

Address.....

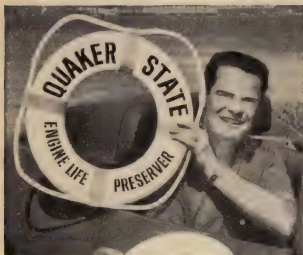
City..... State..... Zip.....
Code.....

Accredited Member National Home Study Council

Test your automotive I.Q.



The second scale marked A on this tach measures what?



What does this symbol stand for?

Scale shows torque peak at which an engine produces the most pulling power. The life preserver means Quaker State Motor Oil—the best engine life preserver for your car. Made from 100% Pure Pennsylvania Grade Crude Oil, Quaker State helps keep your car on the road and out of the repair shop. To keep your car running young, always ask for Quaker State Motor Oil—by name.



QUAKER STATE OIL REFINING CORPORATION
OIL CITY, PENNSYLVANIA

LETTERS continued

and two or three aboard, it will easily do 40 mph. It's really a thrill when you hit the throttle and she climbs to her points. Fleming, Colo. LLOYD AND TERRY ROWAN

No Grabber

Just last week my son had the same experience as Mort Schultz reported in *Money Grabber* (page 182, September PM). His 1963 Rambler Classic, which was just two months over the 24-month guarantee, was using excessive amounts of oil. The manufacturer installed new valve seals without cost.

It's also interesting to observe that the factory felt that the type of grease used on the front-wheel bearings of the full line of 1963 Ramblers would not stand up—and then notified owners and repacked the wheels without charge.

Springfield, Mass. WILLIAM B. READ SR.

Spooklights and Flying Saucers

So you asked a couple of mechanical engineers to answer a problem in meteorology (*PM Tracks Down the Ozark Spooklight*, page 116, September PM). You got a mechanical answer, and you deserved it.

I would like to know why lights in the sky are always "explained" by calling them balloons, airplanes, planets, spaceships, or reflected headlights. (Of course, there's the ever-popular temperature inversion bit, but that works only on radar.) The solid-object answer seems to make the technicians happiest.

I've seen "flying saucers" twice. And I've reached the conclusion that the objects were not solid and had no control over the direction they traveled or the speed at which they traveled. They most likely came into existence as negative electrical charges generated by atmospheric conditions.

The next step in their becoming visible would be an air current containing an amount of dust with a positive charge. As the air current reached the area of negative charge, the charge would be attracted by the positively charged dust particles and pulled into the air current. The resulting display of light would be forced to follow the air current, moving against the wind.

Chicago, Ill.

D. BRUCE BERRY

Okay, you can have your way with flying saucers—but we'll stick with Author Bob Gannon's explanation for the Ozark Spooklight. It's automobile headlights.

THE EDITORS

New Nailless Royalcote Panel Application System

takes the hard work out of paneling a room



New Royalcote general-purpose adhesive quickly and permanently affixes Royalcote Panels in place. No unsightly nail holes. Apply with caulking gun over solid backing, furring strips, or studs.



Large, precision-cut Royalcote Panels are made to order for do-it-yourselfers. Easy to handle, easy to line up. They cover a wall in no time flat. Adhesive forms a permanent bond, dries quickly, yet allows adjustment.



Finish the job with Royalcote color-matched moldings. Your choice of metal, or vinyl-covered wood, including base, cove, casing inside and outside corners. Moldings also can be applied with Royalcote Adhesive.



For a beautiful, professional-looking finished job that's as easy as one, two, three—see your lumber dealer and choose from 13 Royalcote woodgrains, plus Marbletone. Send coupon for full-color booklet.

 **MASONITE**
...does it better

Royalcote and Marbletone are registered trademarks of Masonite Corporation

MASONITE CORPORATION Dept. PM-11
Box 777 • Chicago, Ill. 60690

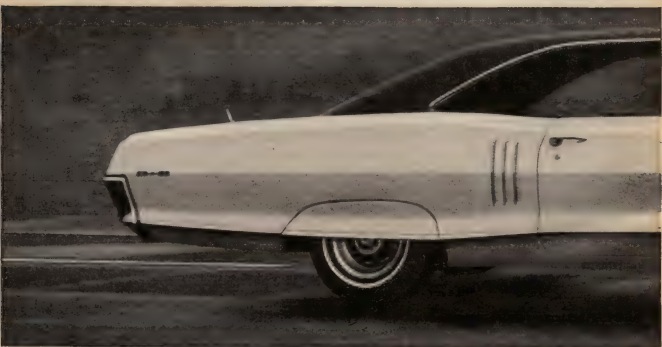
Please send me the full-color, eight-page booklet,
"How To Be Your Own Decorator Using Royalcote
Woodgrain Paneling."

Name

Address

City State Zip Code

Our 1966 version of the double whammy.

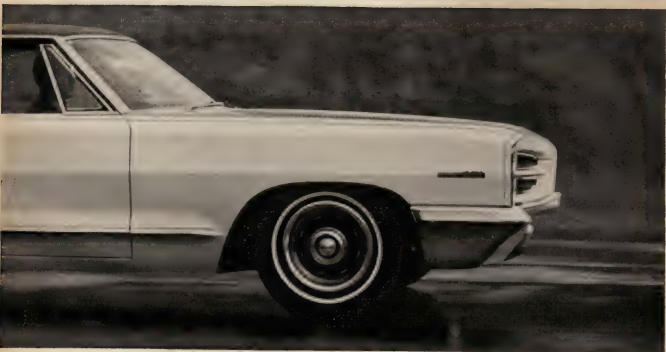


That heroic time-machine you see on top is the new *Gran Turismo Omologato*, otherwise known as the redoubtable Pontiac GTO. Under its hood is a 335-hp engine with quad carburetion that delivers torque as if the supply were limitless—431 lb.-ft. at 3200 rpm. There's a 360-hp version with 3 2-barrels. Standard box is a 3-speed all-synchro column shift. Heavy-duty 3-speed or four-speed are available, both with Hurst floor shifter. New buckets are practically wraparound. Suspension? Heavy-duty, of course. Options? You name it, we've got it. Probably chromed.

Below the GTO is its illustrious counterpart, the Pontiac 2+2. Its standard 421 cubic inch engine delivers 338 hp and 459 lb.-ft. of torque out of a four barrel. And you can specify up to 376 hp with a tri-carb. Like the GTO, air cleaner and rocker covers are chromed, body pinstriped. Inside there are enveloping new buckets, carpeting, an all-synchro 3-speed floor shifter.

And remember we practically invented performance options. For the last word, see your Pontiac dealer and get the GTO/2+2 catalog.

Pontiac Motor Division • General Motors Corporation



The tiger scores again! Wide-Track Pontiac/'66

Since when is a six a surprise?



In its 165-hp form (standard on all Tempests, Tempest Customs, and LeMans), our new six isn't going to surprise many people. Even if it is an overhead cam job. But don't knock it. Only a dozen years ago, engineers were busting their bearings to squeeze that out of a production *premium gas* V-8. Our six does it on regular.

The engine we're talking about is the 207-hp high compression version. It comes with a four-barrel Quadrajet carburetor, a split-manifold exhaust system that sounds like thunder in the Alps, and a chromed air cleaner in a package that includes heavy-duty shocks, springs, and

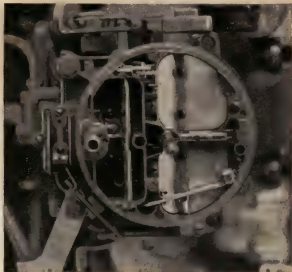
stabilizer bar, an all-synchro 3-speed with Hurst floor shifter, distinctive emblems and sport striping. Or you can order our new, all-synchro close-ratio 4-speed.

The OHC-6 weighs in at a couple of hundred pounds less than V-8s of comparable horsepower, so you can see how the power/weight ratio escalates.

You can order the 207-hp package in any LeMans, Tempest Custom, or Tempest (except wagons). Read more about this new kid on the block in the GTO/2+2 catalog.

Pontiac Motor Division • General Motors Corporation

Starting right now!



The tiger scores again! Wide-Track Pontiac/'66

10¢ says you have BEAUTIFUL HANDS

under all that grease, grime,
paint, shoe polish, etc.

Take this coupon to your grocer and find out!



This coupon worth 10¢ off the purchase
of Boraxo Waterless Hand Cleaner in
the new Pressurflo Container.

Mr. Dealer: For prompt reimbursement for this coupon, send it to BORAXO, Box 1475, Clinton, Iowa. We will pay you 10¢, plus 2¢ for handling, provided coupon is redeemed only on Boraxo Waterless Hand Cleaner, and invoices showing your purchase of sufficient stock to cover coupons presented for payment can be shown on request. Coupons are non-transferable and redeemable only through Boraxo retailers. Coupon is void if use is taxed, restricted or prohibited by law. Any sales tax must be paid by customer. Cash redemption value 1/20 of 1¢. 20 Mule Team Products Department, U.S. BORAX & CHEMICAL CORPORATION.

PM-11-65

NEWS FROM THE MILITARY BY WILLIAM R. KREH

The female leg and antitank missiles now have something in common—nylon stockings. The Army needed a covering for missile launch tubes. It had to be a sheer, fine-mesh fabric capable of stretching four or more ways at once. Chemists started experimenting and found that chemically-treated women's hosiery met the need like nothing else on the market.

An obsolete weapon that was shelved by the Marine Corps in 1956 has found new life in Vietnam. The 60-mm mortar was replaced by the 81-mm mortar in 1956 because of its longer range. The 60, however, is lighter, easier to handle and can be carried in one piece on patrol. It's been found an ideal support weapon for Vietnam combat patrols.

Ocean depths down to 56,000 feet will be simulated in a new pressure tank being built by the Navy at Annapolis, Md. The tank will be used to develop and test equipment such as submarine machinery, salvage and rescue devices, mechanical operating arms and pressure capsules. It will be finished in 1967.

Navy drill. When a vital part of the guided missile system of the USS *Providence* refused to work recently, it appeared the cruiser would be late for operational tests. It was found that a fine strand of wire had pulled loose; alloys in the wire weren't adhesive to solder. The weapons officer, Lt. Cmdr. Jack Griffith, had an idea and called on the ship's dentist, Lt. Cmdr. R. E. Howe. The dentist drilled several holes and packed the wire into them with amalgam, a substance used for filling teeth. It worked perfectly and the *Providence* was on time for her tests.

Edible as ever. Five World War I emergency rations recently received by the Army's Quartermaster Museum at Fort Lee, Va., have been found to be still edible. Packed in metal containers, each ration consisted of a half-pound bread and meat item, three one-ounce chocolate bars, a gram of pepper and three-fourths of an ounce of salt.

Other still-edible rations acquired by the museum include hardtack crackers from the Civil War and soup from the Greeley Greenland expedition of 1884.

MOVE UP FASTER—MAKE MORE MONEY WITH N.T.S. "PROJECT METHOD" HOME TRAINING

Just getting started in industry? Being by-passed because you're not up on new industry methods? Don't let technical progress — automation — pass you up. Let an N.T.S. Project Method Home Training program help you **MOVE UP FASTER, MAKE MORE MONEY!**

N.T.S., a leading technical school for over 60 years, **shop-tests every lesson and manual.** Easy-to-follow, fully-illustrated lessons help you learn fast. Look over these big-opportunity home study courses. Choose your field! You'll soon be on your way to a high-paying new career.

ELECTRONICS DIVISION

1. Electronics-TV-Radio Servicing and Communications
2. Master Course in Electronics TV-Radio. Advanced TV and Industrial Electronics
3. FCC License Course

Train yourself easily, quickly for America's "big future" industry!

4. Radio Servicing (AM-FM-Transistors)
5. Television Servicing (Including Color)
6. Stereo, Hi-Fi and Sound Systems
7. Basic Electronics
8. Electronics Math



AUTO-MECHANICS DIVISION

1. Automotive-Diesel Master Course
 2. Automotive Mechanics
 3. Diesel Mechanics
 4. Engine Tune-up and Electricity
- Eighty million cars and trucks need maintenance! Here's opportunity for you — in manufacturing, in sales and service — in your own auto repair business!



AIR CONDITIONING-REFRIGERATION DIVISION

1. Air Conditioning-Refrigeration Servicing Course
 2. Air Conditioning, Refrigeration & Electrical Appliances Master Course
- Good income in installation & servicing homes, factories, schools, hotels & motels, office buildings, stores, cars, trains, buses and in servicing electrical appliances. The trained man in these fields is in demand!



HIGH SCHOOL AT HOME

National offers accredited high school programs. Take only subjects you need. Study at your own pace. Everything included at one low tuition. Check special High School box in coupon for full information and FREE catalog.



HOME APPLIANCES DIVISION

1. Home Appliances Master Technician's Course. Prepares you quickly for a business of your own in all phases of major and small appliance work.
2. Home Appliances Servicing Course. Prepares you for a part or full time job. Earn while you learn.



SEE OTHER SIDE

for Big Kits at no extra cost

Classroom Training at Los Angeles.

You can take classroom training at Los Angeles in Sunny Southern California. N.T.S. is the oldest and largest school of its kind. Check Resident School box in coupon for details.



NATIONAL TECHNICAL SCHOOLS

WORLD-WIDE TRAINING SINCE 1905

4000 S. Figueroa Street
Los Angeles, Calif. 90037

YOU ENROLL BY MAIL UNDER N.T.S. "NO OBLIGATION" PLAN. WE HAVE NO SALESMEN: IT MEANS LOWER TUITION FOR YOU.

Send Post Card
for FREE BOOK and
Sample Lesson

TEAR OUT AND MAIL THIS CARD TODAY. CHECK ONE ONLY.

ELECTRONICS DIVISION

- ☐ Electronics-TV Radio Servicing and Communications
- ☐ Master Course in Electronics-TV-Radio Advanced TV and Industrial Electronics
- ☐ FCC License Course
- ☐ Radio Servicing (AM-FM-Transistors)
- ☐ Television Servicing (Including Color)
- ☐ Stereo, Hi-Fi and Sound Systems
- ☐ Basic Electronics
- ☐ Electronics Math

HOME APPLIANCES DIVISION

- ☐ Home Appliances Master Technician's Course
- ☐ Home Appliances Servicing Course



Dept. 201-115

AUTO-MECHANICS DIVISION

- ☐ Automotive-Diesel Master Course
- ☐ Automotive Mechanics
- ☐ Diesel Mechanics
- ☐ Engine Tune-up and Electricity

AIR CONDITIONING-REFRIGERATION DIVISION

- ☐ Air Conditioning-Refrigeration Servicing Course
- ☐ Air Conditioning, Refrigeration & Electrical Appliances Master Course

HIGH SCHOOL DEPARTMENT

- ☐ High School at Home

Name _____ Age _____

Address _____

City _____ State _____

Please fill in Zip Code for fast service

☐ Check here if interested ONLY in classroom training at Los Angeles.

QUICK, PRACTICAL WAY TO HIGHER PAY

Train with one of America's leading home-study technical schools.

ELECTRONICS DIVISION

Electronics training opens a world of interesting high-pay jobs. Fully illustrated lessons, shop manuals and schematics teach you quickly, easily. **BIG EQUIPMENT KITS** come with many of the electronics Project Method courses — **AT NO EXTRA COST, NO KIT DEPOSITS.**



AUTO-MECHANICS DIVISION

PROFESSIONAL TOOLS AND EQUIPMENT COME WITH ALL N.T.S. AUTO-MECHANICS COURSES! NO KIT DEPOSITS REQUIRED — NO EXTRA COST!

Service your own car after the first few lessons! Earn while you learn by doing repairs for others! Complete, practical N.T.S. shop tested home training prepares you to be a highly skilled automotive technician.



AIR CONDITIONING — REFRIGERATION DIVISION

You get the **TOOLS, TESTERS, EQUIPMENT** you need — with **NO EXTRA CHARGE, NO KIT DEPOSITS.** Learn about compressors, condensers, evaporators, gas and electric air conditioning. Covers auto and bus air conditioning as well as home and industrial. If you want to start your own business, N.T.S. provides valuable, practical help.



**SEE
OTHER
SIDE**

For Course
Information

HOME APPLIANCES DIVISION

With your Home Appliance Course you get — **AT NO EXTRA COST TO YOU — PROFESSIONAL APPLIANCE TESTER AND TOOLS.** You can soon begin making repairs for yourself and earn extra money fixing appliances for others. Practical, easy-to-follow instruction. Diagrams and illustrations help you learn quickly.



BUSINESS REPLY MAIL

No Postage Stamp Necessary If Mailed in the United States

— POSTAGE WILL BE PAID BY —

NATIONAL TECHNICAL SCHOOLS

WORLD-WIDE TRAINING SINCE 1905

**4000 South Figueroa Street
Los Angeles, California 90037**

FIRST CLASS

Permit No. 3087
Los Angeles, Calif.

FILL OUT & MAIL CARD

**— GET FULL COURSE
DETAILS AND
LEARN ABOUT THESE
N.T.S. "EXTRAS"**

1. "No Obligation" Enrollment
2. Student Dividend Plan
3. Bonus Classroom Training

**FILL OUT AND MAIL
THIS CARD TODAY!**



Accredited Member —
National Home
Study Council

WATCH REPAIRING SURELY BEATS FACTORY WORK...

Why don't you try it too?



READ WHAT BILL BOTKIN SAYS:

"I worked in a factory for two years before starting the shop, and believe me, I was glad to leave... I started this shop in June 4, 1962. The fourth week that I was open, I took in two hundred dollars... the shop is growing all the time... I make my entire living from it. I want to thank you for the help your school has given me in becoming independent and in becoming my own boss. I couldn't be where I am today if it were not for your home study course."

—William E. Botkin, Muncie, Indiana

CHICAGO SCHOOL OF WATCHMAKING

Founded 1908

Dept. 1115, Fox River Grove, Illinois 60021

SEND TODAY FOR A FREE SAMPLE LESSON

You'll receive a free illustrated booklet outlining this course. No obligation. No salesman will call.

FREE SAMPLE LESSON

CHICAGO SCHOOL OF WATCHMAKING

Dept. 1115, Fox River Grove, Illinois 60021

Please rush FREE SAMPLE LESSON and full information to tell me how I can learn watch repairing at home.

NAME _____ AGE _____

Address _____

City _____ State _____ Zip Code _____



Enjoy the fun of building and the thrill of flying your own Bensen Gyrocopter

Fly low and slow—or high and fast, as you wish—in this easy to handle Copter. World's lowest priced one-man aircraft! Economical to operate. Designed by aeronautical engineers for easy building with hobby-shop tools. Bensen whirlybirds have brought the thrills of personal flying to thousands of amateur and professional flyers all over the world. 3-View Drawings, specs, photos of Gyrocopter \$3 or Gyroglider \$2. Order today!

SEND \$2 or \$3 BENSEN AIRCRAFT CORP., Dept. PM-115
Raleigh-Durham Airport, Raleigh, N. C. 27602

NAME _____
ADDRESS _____

Big Profits in UPHOLSTERY Get Your Share... FAST!

EARN BIG MONEY **3** NEW EASY WAYS

1. Be your own boss, make up to 85% profit.
2. Start earning right away at home in spare-time—keep furniture you make, or sell for hundreds of dollars.
3. Today's home and office upholstery, re-upholstery, slipcover boom make it easy to take your pick of big-pay jobs.

LEARN FAST—EARN FAST
You get expert instructions, plus all tools, new wooden frames, materials, fabrics, business tips, wholesale privileges, decorating magic AT NO EXTRA CHARGE. FREE Book, sample lesson pages show you how—no obligation—no salesman. Write TODAY.

UPHOLSTERY TRADES SCHOOL

(Div. of Tech. Home Study Schools)

Dept. 510-115, Little Falls, New Jersey 07424
(N. J. State Approved. Accredited Member National Home Study Council, Vet. Approved.)

MAIL COUPON TODAY

UPHOLSTERY TRADES SCHOOL, Dept. 510-115,
(Division of Technical Home Study Schools)
Little Falls, New Jersey 07424

Please send me FREE book, "Your New Way to a Successful Career," and FREE sample lesson pages. No obligation—no salesman will call.

Name _____

Address _____

City _____ State _____ Zip _____



FREE
Deluxe Illustrated Book and Sample Lesson Pages



Tools, Equip., Frames, Materials, Fabrics. Supply yours with course.

Established 1939

BY JOHN F. PEARSON
SCIENCE
WORLDWIDE

Hula hoops—remember them?—are back. But this time they're not being twirled. NASA engineers have found that the hoops, cut apart and with one end plugged, make ideal storage tubes for wire used in building the triggering systems for atomic-powered engines. Advantages are portability, easy storage and quick identification of the wire because of the hoops' bright colors.

Flame throwers and poison gas are being used in a campaign in the mountains of Mexico's Chihuahua State. The enemy: giant vampire bats. Attacks by bats, according to press reports, have resulted in the death of one child and sent dozens of other victims to the hospital. Villages are being supplied with rabies vaccine.

Hippo pie, buffalo goulash and elephant sausage will soon be on menus in the new African nation of Zambia. The country has an overabundance of wildlife, and a game-cropping program is expected to put about 900,000 pounds of meat on the market. The step is also calculated to improve the average diet, which is desperately light on protein.

Higher and higher. The population of the U.S. will hit 200 million around May, 1967, according to the Population Reference Bureau of Washington, D.C. If our present rate of growth continues—it's about 7200 a day—in 60 years our population will be roughly the same as India's is today: about 500 million.

A two-mile-long laser beam has been folded into a 10-foot space by reflecting it more than 1000 times between two mirrors. The experiment by Bell Telephone researchers provides a new way of measuring very small losses of light in lenses and other optical materials.

Sharks in the desert. Fossils of four species of shark were recently found in the barren area of Israel known as the Negev. About 130 million years ago, say Israeli scientists, the Negev was covered by a warm sea.

Atomic-age roadbuilding. California's Division of Highways is using a small black box called a nuclear density and

moisture tester in constructing new major roads. The instrument, which is operated only by AEC-licensed state employees, is designed to test roadbed compaction, one indication of how well the highway will stand up under the pounding of traffic.

An electric fish counter has been installed in a dam on Britain's River Leven. In a small gap in the dam, through which fish make their way, scientists have put a fiberglass tube fitted with band electrodes made of stainless steel. Fish passing through the tube cause a change in the resistance to the current between the electrodes, activating a tally mechanism.

Second largest known meteorite in the world may be removed from Greenland and put on display in Denmark. The 15-ton meteorite, discovered by a Danish engineer, is thought to have embedded itself in glacial ice some 10,000 years ago.

Astronauts returning from future space flights may be scooped out of the water instead of being hoisted by helicopter sling. NASA has developed a scoop attachment for helicopters for rescue and recovery operations at sea. The 175-pound device consists of a retractable rigid boom and net attached to the forward part of the helicopter. The boom is made of tubular aluminum and the basket of plastic-covered wire net.

A square-shouldered pineapple has been developed by Australian researchers. It is said to be juicier and contains less waste than the conventional round-shouldered variety—a boon to canners. The development follows five years of research and experiments with 25,000 pineapple plants.

Infrared sensors mounted on airplanes are being used by the U.S. Geological Survey to map fresh water that's leaking to the sea in Puerto Rico and the Virgin Islands. The sensors respond to the temperature difference between the fresh water and the sea water, with the infrared film showing a lighter tone for warmer objects. The scientists hope to spot the sources of the fresh water so that it can be contained to prevent it from escaping into the sea.

KEEP PACE WITH SPACE AGE! SEE MANNED MOON SHOTS, SPACE FLIGHTS, CLOSE-UP!



SCIENCE BUYS

For FUN, STUDY or PROFIT

EXCELLENT for XMAS GIFTS!

'FISH' WITH A WAR SURPLUS MAGNET

Go Treasure Hunting On The Bottom

Great idea! Fascinating fun and sometimes tremendously profitable! Tie a line to our 5-lb. Magnet—drop it overboard in bay, river, lake or ocean. Trawl it along the bottom—your "treasure" haul can be outboard motors, anchors, fishing tackle, all kinds of metal valuables. 5-lb. Magnet is war surplus—Alnico V Type—Gov't. Stock No. 70.570-H. 3 1/2 lb. Lifts 40 lbs. \$ 8.75 Postpaid
Stock No. 70.572-H. 2 1/2 lb. Lifts 175 lbs. \$18.75 P.O.D.
Stock No. 85.152-H. (Lifts over 350 lb.) \$39.60 F.O.B.



See the Stars, Moon, Planets, Close Up! 3" ASTRONOMICAL REFLECTING TELESCOPE

Mt. Palomar Type! An Unusual Buy!

See the Rings of Saturn, the fascinating planet Mars, huge craters on the Moon, phases of Venus. Equatorial Mount with lock on both axes. Aluminized and overcoated 3" diameter high-speed f/10 mirror. Telescope equipped with a 60X eyepiece and a mounted Harlow Lens. Optical Finder. PRICE with Scope, Valueable STAR CHART plus 272-page "HANDBOOK OF TELESCOPE USE TO YOUR TELESCOPE BOOK" \$29.95 Postpaid
Stock No. 85.050-H

4 1/2" Reflecting Telescope—up to 225 Power Stock No. 85.105-H \$79.50 F.O.B.

Superb 6" Reflector Telescope Up to 576 Power. Equatorial mount and Pedestal Base. Stock No. 85.086-H \$139.50 F.O.B.

OPAQUE PROJECTOR

Projects illustrations up to 3" x 3 1/2" and enlarges them to 35" x 50" if screen is 6 1/2 ft. further away. No film or negatives needed. Projects charts, diagrams, pictures, photos, lettering in full color or black-and-white. Operates on 115 volt, 60 cycle current. 6-ft. extension cord and plug included. Operates on 60 watt bulb, not included. Size 12" x 8" x 4 1/2". Weight 1 lb. 2 oz. Plastic case. Stock No. 70.199-H \$7.95 Postpaid
Fascinating New Kaleidoscope Insert. Same unit as above, but provides endless additional projects with everchanging kaleidoscope patterns. Stock No. 60.714-H \$10.00 P.D.



SOLVE PROBLEMS! TELL FORTUNES! PLAY GAMES! NEW WORKING MODEL DIGITAL COMPUTER

ACTUAL MINIATURE VERSION OF GIANT ELECTRONIC BRAINS

Fascinating new see-through model computer actually solves problems, teaches computer fundamentals. Adds, subtracts, multiplies, shifts, complements, carries, memorizes, counts, compares, sequences. Attractively colored, rigid plastic parts easily assembled. 12" x 3 1/2" x 4 1/2". Incl. step-by-step assembly diagrams. 32-page instruction book covering operation, computer language (binary system), programming, problems and 15 experiments. Stock No. 70.583-H \$9.98 P.D.

WAR SURPLUS AMERICAN-MADE 7x50 BINOCULARS

Big savings! Brand new! Crystal clear viewing—7x power. Every optical element is coated. An excellent night glass—the size recommended for excellent viewing. Individual eye focus. Exit pupil 7 mm. Approx. field at 1,000 yds. is 175 ft. Carrying case. Carrying case. 7 x 50's normally cost \$274.50. Our war surplus price saves you real money.
Stock No. 134-H \$78.40 P.D.
8 x 30 Binoculars—similar to above. \$40.00 Postpaid
Stock No. 983-H
7 x 35 American Made Binoculars. \$55.00 P.D.
Stock No. 984-H



BUILD A SOLAR ENERGY FURNACE

A fascinating new field. Build your own Solar Furnace for experimentation—many practical uses. Easy! Inexpensive! Use scrapwood! We furnish instructions. This sun powered furnace will generate terrific heat—2000° to 3000°. Fuses enamel to metal. Sets paper aflame in seconds. Use our Fresnel Lens 11" sq. F.L. 19". Stock No. 70.533-H \$6.00 Postpaid

EXPLORE THE FASCINATING WORLD OF MAGNETISM

NEW 23 MAGNET VARIETY KIT

11 SHAPES! MANY COMPOSITIONS!

Ever ripen tomatoes by magnetism—paint pictures using magnet as a brush and iron filings as paint! Surprising new ideas and uses for the bewildering forces of magnetism are continually discovered. Here, in one low-cost kit, you can learn and experiment with various compositions that obsoleted Magnetite—the natural magnetic ore. Terrific assortment includes ferrites, ceramics, flexible rubber, alnico in every shape imaginable—up to 10 lbs. pull. Sizes range from 3/4" x 7/16" x 1/2" to 1 1/2" x 3" x 3/4". Includes three—2 lb. alnico disc, ceramic alnico disc w/center hole, 2 lb. alnico cyl., 2 lb. alnico bar, 2 lb. alnico sheet, 2 baby alnico bar pieces for auto. ceramic magnets, bar magnet keeper, 2 disc magnets, comp. info. and inst. Stock No. 70.780-H \$5.00 P.D.

ORDER BY STOCK NUMBER (SEND CHECK OR MONEY ORDER—SATISFACTION GUARANTEED)
EDMUND SCIENTIFIC CO., BARRINGTON, N. J.

SCIENCE TREASURE CHESTS

For Boys—Girls—Adults!

Science Treasure Chest—Extra-powerful magnets, polarizing filters, compass, one-way-mirror film, prism, diffraction grating, and lots of other items for hundreds of thrilling experiments, plus a Ten-Lens Kit for making telescopes, microscopes, etc. Full instructions included.

Stock No. 70.342-H \$5.50 Postpaid

Science Treasure Chest DeLuxe—Everything in Chest above plus exciting additional items for more advanced experiments.

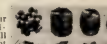
Stock No. 70.343-H \$10.50 Postpaid

MINIATURE WATER PUMP

Wonderful for experiments, miniature waterfalls, fountains, Christmas gardens, 110 gage railroad backdrops, hobbyists, labs, schools. Pumps continuous flow of water, etc. Tiny (2 1/2" x 1 1/2") electric motor and pump ideal for hobbyists, labs, schools. Pumps continuous flow of water at rate of one pint per minute at a 12" head. With 2 D batteries in series will pump to 24" high. Works in either direction. Stock No. 50.345-H \$2.25 Postpaid

WOODEN SOLID PUZZLES

12 different puzzles that will stimulate your ability to think and reason. Here is a fascinating assortment of wood puzzles that will provide hours of pleasure. Twelve different puzzles, animals and geometric forms to take apart and reassemble, give a chance for all the family, to test skill, patience, and best of all to stimulate ability to think and reason while having lots of fun. Stock No. 70.205-H \$3.00 Postpaid



WAR SURPLUS ELECTRIC GENERATOR

Brand new Signal Corps Electric Generator for scientific experiments, electrical uses, demonstrations. Generates up to 90 volts by turning crank. Use in high impedance young. Charge ground and bring up night crawlers for bait or study. 2 Alnico Magnets alone worth over \$10. Price, Wt. 2 lbs. Gov't. \$15.
Stock No. 50.225-H \$6.95 Postpaid
Same type generator, mounted, with light, as electric demonstrator. Stock No. 50.265-H \$11.95 Postpaid

HOME WEATHER STATION

New "Weather Station" is highly sensitive to weather changes. Consistently accurate thermometer to +27°, barometer to +.5%, foretells weather changes from 12 to 24 hours in advance. Hygrometer calibrated to percent relative humidity. Excellent for teaching weather phenomena and meteorological hobby work. Instrument mounted on handsome wood-grained wall panel 15 1/2" x 25". Meter cases heavily metalized—combines beauty and protection. Dials in etched aluminum, of high precision. Full instructions. Stock No. 70.607-H \$9.95 Postpaid



NEW POPULAR SCIENCE FUN CHEST

Here are Edmund's 9 top selling science toys and curiosities in one fascinating, low-cost package. Perfect gift item. Amuses and delights young and old for hours on end. Educational! Top! Teaching basic science principles in a wonderful new fun way. Incl. Solar Radiometer—spins at 3,000 rpm. Albert the Hobbing Bird—runs continuously on thermal energy. Amazing Sealed Mercury Puzzle! Five 2-sided Ceramic Magnets. Magic Burning Glass in Zip-Lip Poly Bag; Magnetic Doctore and Puzzles. Burning Ball—ball spins, dog approaches; Diffraction Grating. Rainbow Viewer. PIK-UP Ring (with Edmund T.A.K.). Popular booklet, "Astronomy and You." All in die-cut storage box with complete instructions. Stock No. 70.787-H \$5.00 P.D.



Diagnose Hidden Trouble with Professional Stethoscope

Designed for use by physicians, this super-sensitive stethoscope is ideally suited for detecting faults in machines and engines, and in fluid, air and gas lines. Hundreds of uses in auto repair shops, labs, hobby, educational applications. Stock No. 50.270-H \$6.95 Postpaid
BARGAIN PRICE STETHOSCOPE—excellent value. Stock No. 50.223-H \$2.95 Postpaid

Order by Stock No.—Send Check or M.O.—Money-Back Guarantee
EDMUND SCIENTIFIC CO., BARRINGTON, NEW JERSEY

MAIL COUPON FOR FREE CATALOG "H"

Completely new 1966 Edition, 148 pages
Nearly 4000 Bargains.
EDMUND SCIENTIFIC CO., BARRINGTON, N. J.
Please rush Free Giant Catalog "H".

Name.....
Address.....
City..... Zone..... State.....





IT'S MORE FUN TO BUILD

Start with any one of Revell's home raceway system sets

\$30 Enduro
\$40 Gran Turismo
\$55 Europa
\$60 Atlantica
\$100 Americana

Then...add to it!

The Revell raceway system has an interchangeable everything

Build the simplest two lane or most elaborate four lane layouts. Change them when you've mastered the road course and want something more challenging. Add chicanes, lane changers, and other track features. And race the biggest 1/24 scale cars on your Revell home layout by adding

new shoulders and inside apron sections. Here's a complete engineered system of interchangeable parts—track, cars, controllers, power pack, modular piers and accessories—that makes possible construction of any kind of layout.

The major components of the Revell system

TRACK Positive interlocking between sections permits track to be banked without breaking electrical contact. Just plug in the controllers and power pack to a special pre-wired terminal section.



STRAIGHT SECTIONS



CURVED SECTIONS
—14" and 21" radii



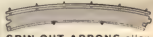
CHICANES



LANE CHANGERS



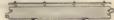
PLUG-IN TERMINAL SECTION



SPIN-OUT APRONS allow your car to simulate the "drift" of actual racing...you get even greater speed in the hairpins. For both 14" and 21" radii curved track.



INSIDE APRONS for both 21" and 14" radii curved track



FULL APRON FOR STRAIGHT TRACK



INSIDE CURVED AND SPIN-OUT APRON TRANSITION SECTIONS



MODULAR PIER SUPPORTS to build exact height of supports needed for overpasses and crossovers.



ILD UP WITH REVELL!

THE POWER PACK. Lots of power! 1500 milliamps minimum

THE CONTROLLERS.

Smooth, quick acceleration
Built-in brakes.

The cars—1/32 scale



MERCEDES
300 SL "GULLWING"



FERRARI 250 GTO



CORVETTE STING RAY
FASTBACK



ASTON MARTIN DB-5

Revell Home Racing Set 1/32 scale cars have been perfected in hundreds of thousands of commercial raceway miles. Their detailing is authentic, and the components are of the finest quality...rugged, fast motors, lightweight aluminum chassis, metal axles and gears and real rubber tires.

These preassembled Revell cars are the fastest cars that come as standard equipment with any racing set.

Revell also manufactures a complete line of model car kits for commercial raceway use that you can also race on your Revell Home Raceway.

IN 1/24 SCALE. Corvette Sting Ray, Ferrari 250 GTO, Lotus 23, Porsche RS-60, Lotus Ford, BRM and Cobra Ford.

IN 1/32 SCALE. Cobra, XKE Jaguar, Ferrari 250 GTO, Corvette Sting Ray, Mercedes 300 SL "Gullwing" and Aston Martin DB-5.

Race either 1/24 or 1/32 scale size on the Revell system!



1/24 scale

1 2 3 4 5 6 7



1/32 scale



base of the 1/24 cars. These special apron pieces make 1/32 scale more exciting and realistic too.

For more information on the new Revell Home Raceway Sets and the Revell Systems, write:



Revell, Inc., 4227 Glencoe Ave., Venice, California

See the Revell Home Raceway System in the new Howard Hawks picture "Red Line 7000"....a Paramount release. Listen to "The Go Sounds of the Slots!" a new Reprise Record Album featuring The Revells with the sound, music and language of slot car racing.

Race the same big 1/24 GTOs you race at the commercial raceways on the Revell Home Raceway Set. Just add these special sections to make the roadbed wider, to accommodate the larger wheel.

free

send today for your

ALLIED

money-saving 1966

ELECTRONICS CATALOG



**508 PAGES
value-packed**

**MORE OF THE
BEST & NEWEST
IN ELECTRONICS
FOR EVERYONE**

**SAVE
MOST**

**NEW build-your-own
knight-kits®**



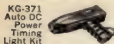
Safari-I
23-Channel CB
Transceiver Kit



KG-375 Auto
Analyzer Kit



KG-221 FM Monitor
Receiver Kit



KG-371
Auto DC
Power
Timing
Light Kit

WIDE SELECTION

see dozens of Knight-Kits
for every need—wonder-
fully easy to build!

GET THIS FAMOUS CATALOG
for Experimenters, Kit Build-
ers, Hi-Fi Fans, CB'ers, Ama-
teurs, Servicemen. Save on:

*Stereo High Fidelity
Tape Recording*

CB 2-Way Radios

FM-AM & AM Radios

Portable TV • Phonographs

Short-Wave & Ham Gear

Automotive Electronics

Test Instruments

Intercoms & P. A.

Power Tools, Hardware

TV Tubes & Antennas

Parts, Tubes, Transistors

EASYTERMS: Use the conven-
ient Allied Credit Fund Plan.

satisfaction guaranteed
or your money back

FROM THE PATENT OFFICE

**NEW
INVENTIONS**

BY M. J. PEDERSEN

Giant "wastebasket" feeds on classi-
fied information from the Government's
secret space and national defense projects.
Toted around in a van under security
guard, the disposal unit makes weekly
pickups of some 300,000 pounds of classi-
fied garbage, chewing it to confetti-sized
bits and pieces by a hammer-milling
process. Easing a grave security problem
of preventing such documents from falling
into the wrong hands once their purpose
has been served, the unit earned patent
3,192,853 for James E. O'Connor, Los
Angeles, California.

Radioactive milk may be decontami-
nated by a process that utilizes a contin-
uous ion exchanger. A polymeric resin is
used to remove a radioactive ion in the
milk and replace it with a nonradioactive
one. Irwin R. Higgins, a former U.S.
Atomic Energy Commission scientist,
earned patent 3,194,663 for the process.
The ion substitution does not otherwise
alter the milk. If a new transportable unit
is successful, it may become standard
stand-by emergency equipment around
the country.

Fruit pickers will be aided by a stretch-
able chute which will conveniently chan-
nel fruit direct from the picker in the tree
to a truck or cart on the ground. With a
funnel at the top end and a cushion at
the bottom—to prevent fruit damage—the
fruit chute earned 3,194,375 for Russell
J. Callow, Sr., Ocala, Fla.

Eggshell membrane—the paper-thin
layer between the shell and the white—
hastens the healing of burns, according to
patent 3,196,075, granted Dr. Irene Neu-
hauser of the University of Illinois Medi-
cal School, Chicago. After the membrane
is pulverized, the pulp is formed into a
sheet that can be placed over burns.

Make America beautiful—the program
may be given a helpful nudge by a port-
able machine that ruthlessly chops up
junked cars. Joseph R. Mordan, Alden,
N.Y., received patent 1,196,726 for the
auto chopper, which could eliminate the
eyesores of automobiles abandoned along
the roadsides. Two or three men using the
new unit can do the same job as 15 men
working with acetylene torches.

ALLIED RADIO

**FREE
catalog**

ALLIED RADIO, Dept. 6-L
100 N. Western Ave., Chicago, Illinois 60680

☐ Send FREE 1966 Allied Catalog.

Name _____
PLEASE PRINT

Address _____

City _____ State _____ Zip _____

THE EXPERTS' WAY TO GIVE A CRISP, NEW LOOK TO OLD FURNITURE



... With Hundreds of Illustrations ... Complete Glossary of Terms ... Precise, Easy-To-Follow Step-By-Step Instructions for Every Job.

Includes:

- Finishing Methods
- Sample Projects
- Sanding & Bleaching Techniques
- Major Repairs and Touch-Ups
- Tips on Unusual Finishes
- Tips On Buying and Care of Tools
- Refinishing of Metal Furniture
- Glazing & Highlighting
- Figures of Wood
- Varnishes, Veneers, Waxing
- Synthetic Finishes
- Types of Solutions
- Complete Glossary of Wood Terms
- Finishing Schedules
- Finer Points of Special Finishes
- Refinishing Antiques
- Reupholstering With Foam Rubber
- Lifting Dents & Bruises
- Weaving Rush Seats
- Oils & Oiling
- Wood Dyes
- Rottenstoning

... AND MUCH, MUCH MORE

Send \$4.95 Today to:

POPULAR MECHANICS BOOK DEPT.

575 LEXINGTON AVENUE

NEW YORK, N.Y. 10022

ACCOUNTING

Accounting for Business
Programmers
Cost Accounting
C.P.A. Review
Estate & Trust
Accounting
Executive Accounting
Federal Tax
General Accounting
Industrial Accounting
Legal Accounting
Office Accounting
Personal Income Tax &
Social Security
Practical Accounting
Public Accounting
Small Business
Accounting
Starting & Managing a
Small Bookkeeping
Service

**ARCHITECTURE
AND BUILDING**

Architectural Drawing &
Designing
Architecture
Building Contractor
Building Estimator
Building Inspector
Building Maintenance
Carpenter-Builder
Carpentry & Millwork
House Planning & Interior
Design
Mason
Painting Contractor
Reading Arch. Blueprints
Review in Arch. Design &
Practice
Review of Mech. Systems
in Buildings

ART

Amateur Artist
Commercial Art
Commercial Cartooning
Illustrating
Interior Decorating
Oil Painting for Pleasure
Show Card & Sign
Production
Show Card Writing
Sign Painting & Designing
Sketching & Painting

AUTOMOTIVE

Automatic Transmission
Specialist
Automobile Body
Rebuilding & Refinishing
Automobile Electrical
Technician
Automobile Engine Tune-Up
Automobile Technician
Automotive Mechanic
Diesel-Gas Motor Vehicle
Engines

BUSINESS

Advertising
Basic Inventory Control
Business Administration
Business Management &
Marketing
Business Management &
Production
COBOL Programming
Condensed Business
Practice
Industrial Psychology
Managing a Small Store
Marketing
Modern Executive
Management
Office Management
Programming for Digital
Computers
Programming the IBM 1401
Computer
Purchasing Agent
Retail Business Management
Statistics and Finance
Systems and Procedures
Analysis

CHEMICAL

Analytical Chemistry
Chemical Engineering
Chemical Engineering Unit
Operations
Chemical Laboratory Tech.
Chemical Process Control
Technician
Chemical Process Operator
Elements of Nuclear Energy
General Chemistry
Instrumental Laboratory
Analysis

CIVIL ENGINEERING

Civil Engineering
Construction Engineering
Highway Engineering
Principles of Surveying
Reading Highway
Blueprints
Reading Structural
Blueprints
Sanitary Engineering
Sewage Plant Operator
Structural Engineering
Surveying and Mapping
Water Works Operator

DRAFTING

Aircraft Drafting
Architectural Drafting
Electrical Drafting
Electrical Engineering
Drafting
Electronic Drafting
Introductory Mechanical
Drafting
Mechanical Drafting
Pressure-Vessel and Tank
Print Reading
Sheet Metal Layout for
Air Conditioning
Structural Drafting

ELECTRICAL

Electric Motor Repairman
Electrical Appliance
Servicing
Electrical Contractor
Electrical Engineering
(Power option or
Electronic option)
Electrical Engineering Tech.
Electrical Instrument Tech.
Industrial Electrical Tech.
Industrial Telemetering
Power Line Design and
Construction
Power Plant Operator
(Hydro or Steam Option)
Practical Electrician
Practical Lineman
Reading Electrical
Blueprints

**CAST
YOUR
BALLOT
FOR
A
SUCCESSFUL
FUTURE!**

253 I.C.S.

Special in-plant training programs for industry

Low rates for members of the United States Armed Forces

New! Special Package for Women



I.C.S. is the oldest, largest school of its kind. Over 200 courses for men and women. High school, business, secretarial, interior decorating, engineering. One for you. Direct, job-related. Bedrock facts and theory plus practical

application. You learn from experts. Diploma to graduates.

Clip and mail the coupon **now**. You'll receive, absolutely **FREE**, 3 valuable booklets that have helped thousands. But don't delay. Cast **your** "ballot" today!



253 COURSES

give you
the widest selection
of any home-study
school

Send the attached
postcard today for
the famous I.C.S. Success Kit.

No obligation.
Tear card off right
NOW!

FIRST CLASS
PERMIT
NO. 1000
SCRANTON, PA.

BUSINESS REPLY MAIL. No postage stamp necessary if mailed in United States

POSTAGE WILL BE PAID BY—

International Correspondence Schools
Scranton, Penna. 18515

DEPT. 1237, SCRANTON, PENNA. 18515

Without cost or obligation, send me the Success Kit for the course checked.

ARCHITECTURE and BUILDING TRADES

- ☐ Air Conditioning
- ☐ Architecture
- ☐ Arch. Drawing
- ☐ Building Contractor
- ☐ Carpentry & Millwork
- ☐ House Planning
- ☐ Painting
- ☐ Plumbing & Heating

ART and DESIGN

- ☐ Commercial Art
- ☐ Interior Decorating
- ☐ Illustrating
- ☐ Sketching and Painting

AUTOMOTIVE

- ☐ Auto Electric Technician
- ☐ Automotive Mechanic
- ☐ Engine (Gas & Diesel)
- ☐ Engine Tune-up
- ☐ Transmission Specialist

BUSINESS

- ☐ Accounting
- ☐ Cost Accounting
- ☐ Practical Accounting
- ☐ Bus. Administration
- ☐ Executive Training
- ☐ Marketing
- ☐ Personnel-Labor Rel'n's
- ☐ Programming for Digital Computers
- ☐ Purchasing Agent
- ☐ Real Estate
- ☐ Salesmanship
- ☐ Sales Mgmt.
- ☐ Small Business Mgmt.
- ☐ Traffic Mgmt.

CHEMICAL

- ☐ Analytical Chemistry
- ☐ Chem. Engineering
- ☐ General Chemistry
- ☐ Lab. Technician
- ☐ Nuclear Energy
- ☐ Plastics ☐ Pulp, Paper

CIVIL ENGINEERING

- ☐ Civil Engineering
- ☐ Highway Blueprints
- ☐ Highway Engineering
- ☐ Structural Blueprints
- ☐ Sanitary Engineering
- ☐ Structural Engineering
- ☐ Surveying & Mapping

DRAFTING

- ☐ Architectural
- ☐ Drafting Technology
- ☐ Electrical—Electronic
- ☐ Mechanical

ELECTRICAL

- ☐ Appliance Servicing
- ☐ Electrical Engineering
- ☐ Elec. Motor Repairman
- ☐ Instrument Technician
- ☐ Practical Electrician
- ☐ Practical Lineman
- ☐ Telemetering

ELECTRONICS

- ☐ Automation
- ☐ Electronic Computers
- ☐ Electronics Technician
- ☐ General Electronics
- ☐ Hi-Fi Stereo and Sound Systems
- ☐ Industrial Electronics

ENGINEERING

(Professional)

- ☐ Chemical ☐ Civil
- ☐ Electrical ☐ Mechanical

ENGLISH and

WRITING

- ☐ Business Writing
- ☐ Technical Writing
- ☐ Practical English

HIGH SCHOOL

(Diploma)

- ☐ High School Business
- ☐ High School General
- ☐ High School Math

- ☐ High School Secretarial
- ☐ High School Vocational
- ☐ College Preparatory

LANGUAGES

(Edited by Berlitz)

- ☐ French ☐ German
- ☐ Italian ☐ Spanish

MECHANICAL and SHOP

- ☐ Gas-Elec. Welding
- ☐ Industrial Engineering
- ☐ Ind. Instrumentation
- ☐ Machine Design
- ☐ Machine Shop Practice
- ☐ Mech. Engineering
- ☐ Safety Engineering
- ☐ Shop Blueprints
- ☐ Tool Design
- ☐ Toolmaking

SECRETARIAL

- ☐ Clerk-Typist
- ☐ Legal Secretary
- ☐ Medical Secretary
- ☐ Professional Secretary
- ☐ Shorthand
- ☐ Stenographic ☐ Typist

STEAM and DIESEL POWER

- ☐ Boiler Inspector
- ☐ Power Plant Eng.
- ☐ Stationary Engineering
- ☐ Steam Engineering

SUPERVISION

- ☐ Foremanship—Suprv'n
- ☐ Personnel—Lab. Rel'n's

TV-RADIO

- ☐ Radio and TV Servicing
- ☐ Radio-Tele. License
- ☐ TV Technician

MISCELLANEOUS

- ☐ Textile
- ☐ Other (please specify)

FREE I.C.S. SUCCESS KIT

Check the course of study that interests you. I. C. S. will send you the latest catalog outlining the job and training opportunities in that field. In addition, you will get an actual lesson demonstrating the success-proved I. C. S. method. Both are free.

Also sent free when you mail this card

"How to Succeed"—The remarkable new booklet that tells how success can be yours. A few highlights:

- Self-evaluation charts
- Your motives
- You in review
- Your "master plan"
- Selecting your career
- Your boss and success
- Why people fail
- How to get ahead faster



Accredited Member,
National Home
Study Council

Write for new W. I. C. S.
package for women

Low rates to members of
U. S. Armed Forces!

Special training programs
for industry

Name _____ Age _____

Home Address _____

City _____ State _____ Zip Code _____

Occupation _____

Employed by _____ Working Hours _____ A.M. to _____ P.M.

ENGINEERING (Professional)

Chemical
Civil
Electrical
Industrial Management for
Engineers
Mechanical

ENGLISH AND WRITING

Better Business Writing
Introductory Technical
Writing
Modern Letter Writing
Practical English
Short Story Writing

HIGH SCHOOL

High School Business
High School College Prep.
(Arts)
High School College Prep.
(Engineering & Science)
High School General
High School Mathematics
High School Secretarial
High School Vocational

LANGUAGES

(Edited by Berlitz)
French
German
Italian
Spanish

LEADERSHIP

Basic Supervision
Industrial Foremanship
Industrial Supervision
Personality Development
Personnel-Labor Relations
Supervision

MATHEMATICS

Advanced Mathematics
Mathematics and Mechanics
for Engineering
Mathematics & Physics for
Technicians
Mathematics and Physics
for Engineering
Modern Elementary Statistics

MECHANICAL

Industrial Engineering
Industrial Instrumentation
Machine Design
Mechanical Engineering
Quality Control
Safety Engineering Tech'n'y
Tool Design
Value Analysis

PETROLEUM

Natural Gas Production &
Transmission
Oil Field Technology
Petroleum Production
Petroleum Production
Engineering
Petroleum Refinery Operator
Pipeline Engineering

PLASTICS

Plastics Technician

PLUMBING, HEATING, AIR CONDITIONING

Air Conditioning
Air Conditioning
Maintenance
Domestic Heating with
Oil & Gas
Domestic Refrigeration
Gas Fitting
Heating
Heating & Air Conditioning
with Drawing
Plumbing
Plumbing & Heating
Plumbing & Heating
Contractor
Plumbing & Heating
Estimator
Practical Plumbing
Refrigeration
Refrigeration & Air
Conditioning
Steam Fitting

PULP AND PAPER

Paper Machine Operator
Paper Making
Pulp Making
Pulp & Paper Engineering
Pulp & Paper Making

SALESMANSHIP

Creative Salesmanship
Real Estate Salesmanship
Sales Management
Salesmanship
Salesmanship & Sales
Management

SECRETARIAL

Clerk-Typist
Commercial
Legal Secretary
Medical Secretary
Professional Secretary
Shorthand
Stenographic
Typewriting

SHOP PRACTICE

Drill Operator
Foundry Practice
Industrial Metallurgy
Lathe Operator
Machine Shop Inspection
Machine Shop Practice
Machine Shop Practice &
Toolmaking
Metallurgical Engineering
Technology
Milling Machine Operator
Patternmaking
Practical Millwrighting
Reading Shop Prints
Rigging
Tool Engineering Tech'n'y
Tool Grinder
Toolmaking
Turret Lathe Operator
Welding Engineering
Technology
Welding Processes

STEAM AND DIESEL POWER

Boiler Inspector
Industrial Building
Engineer
Power Plant Engineering
Stationary Diesel Engines
Stationary Fireman
Stationary Steam
Engineering

TEXTILES

Carding
Carding and Spinning
Cotton Manufacturing
Dyeing & Finishing
Loom Fixing
Spinning
Textile Designing
Textile Mill Supervisor
Textile Technology
Warping and Weaving
Wool Manufacturing

TRAFFIC

Motor Traffic Management
Railway Rate Clerk
Traffic Management

TV-RADIO-ELECTRONICS

Communications Tech'n'y
Electronic Fundamentals
Electronic Fundamentals
(Programmed)
Electronic Fundamentals
with Electronic Equip-
ment Training
Electronic Instrumentation
& Servo Fundamentals
Electronic Principles for
Automation
Electronics and Applied
Calculus
Electronics Technician
First Class Radiotelephone
License
Fundamentals of Electronic
Computers
General Electronics
General Electronics with
Electronic Equip. Trng.
Hi-Fi Stereo and Sound
Systems Servicing
Industrial Electronics
Industrial Electronics
Engineering
Industrial Electronics
Engineering Technician
Practical Radio-TV Eng'n'g
Practical Telephony
Principles of Radio-
Electronic Telemetry
Principles of Semiconduc-
tor-Transistor Circuits
Radio Servicing with Radio
Equipment Training
Radio & TV Servicing
Radio & TV Servicing with
Radio Equip. Trng.
Second Class Radiotele-
phone License
Sound Systems Specialist
Telephony, Electronics and
Radio Communications
TV Receiver Servicing
TV Technician

COURSES

In Hawaii: P.O. Box 418, Honolulu

Clip coupon—and take your first big step to real success! I.C.S., Scranton, Penna. 18515

FREE! THE I.C.S. SUCCESS KIT!

Three valuable booklets sent to you free when you mark and mail the I.C.S. coupon. No obligation.

1. "How to Succeed"—A new, exciting booklet that lets you evaluate yourself and your future in an entirely different way!
2. Complete catalog outlining job opportunities and outlook in your field of interest.
3. Sample lesson to demonstrate the success-proved I.C.S. method of spare-time study.

Accredited Member, National Home Study Council

INTERNATIONAL CORRESPONDENCE SCHOOLS **I.C.S.**

Dept. 1255, Scranton, Penna. 18515

Without cost or obligation, send me "HOW TO SUCCEED," the opportunity booklet about the field I have indicated below, and a sample lesson.

Course in which I'm interested:

(Select from listing above)

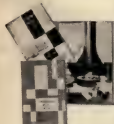
Name _____ Age _____

Address _____ (Indicate Mr., Mrs., or Miss)

City _____ State _____ Zip code _____

Occupation _____ Working hours _____ a.m. to _____ p.m.

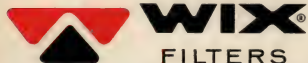
Employed by _____





No Ordinary Oil Filter Can Protect a Car's Engine for the 6,000 Mile Oil Change Interval Specified by Car Factories . . . WIX Multi-Cel Filters Can and Do!

Whether you drive a car, truck or tractor go to the dealer who gives you your money's worth . . . the man who sells WIX Oil, Air and Fuel Filters. Get the extra bonus miles of filtering performance . . . you'll notice the difference with WIX, in improved mileage and reduced engine wear.



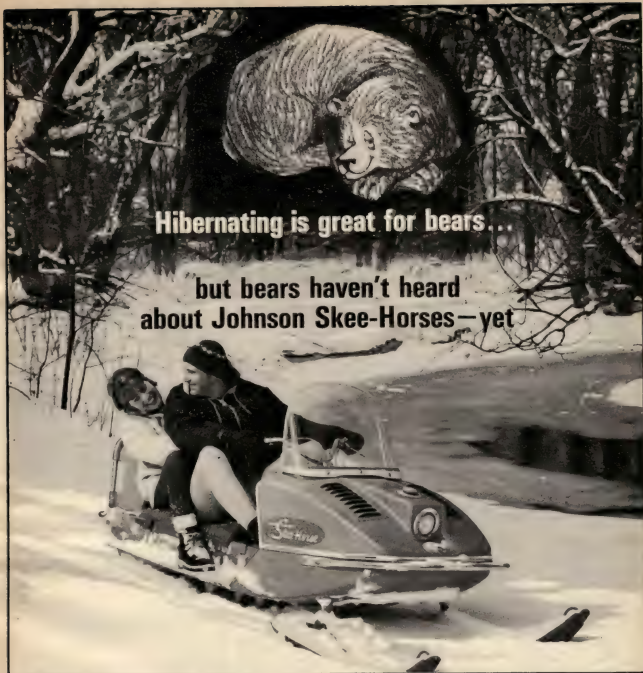
WIX CORPORATION • GASTONIA, N. C.
THE GOLD STANDARD IN FILTRATION

WHAT'S NEW **OUTDOORS** BY STUART JAMES

No trespassing signs in the forests of three northwestern California counties have been replaced with a triangular "welcome" sign that identifies 260,000 acres of forest opened to public recreational use by the California Redwood Assn. Nine lumber companies are cooperating in the program, and the symbol was designed to represent three groups involved, land-owners, recreationists and the government. Twenty-four areas in Del Norte, Humboldt and Mendocino counties offer free picnicking, hiking, camping, swimming, beachcombing and hunting. This is part of a new trend in industry to take an interest in recreation and conservation, and we applaud the lumbering interests. Historically, industry and conservation have been natural enemies. I am reminded of a classic example—the depleted fishing industry in Monterey, Calif. Some years ago a team of biologists was retained to answer the question: What happened to the sardines? After a year of research they made their report: "They went into cans."

Fishing worms and how to get them without digging for them is something that seems to occupy the minds of anglers. Dick Kelly of Houston, Tex., sends us the latest suggestion and it's called stobbin.' He came across this method when he was fishing the White River in the Missouri Ozarks. "You need a large pail and a sledgehammer," he writes. "Then you just go out in the woods, put the pail down and start beating on boulders, stumps, logs and tree trunks with the hammer. The worms come rushing out to see what in hell's going on, and you gather them up and put them in the bucket."

Boondocking on a lightweight trail bike such as the Honda and Yamaha ceases to be fun when you have to change back for street use, a greasy half-hour job of undoing the chain, moving it over sprockets, then reinstalling it and adjusting the tension. But now, with a new device installed, you can make the switch simply by throwing a lever. Called the Go-Matic, it has three small sprockets between the transmission and the two rear sprockets. The engine drives a center sprocket, which is shifted by a lever to drive one or the other of the rear sprockets. It comes in kit form from GO Corp., 1905 Bay Rd., Palo Alto, Calif., and is priced from \$43 to \$64.



So why should *you* waste a perfectly good winter? You'll find it's more than bearable with a Johnson Skee-Horse to take you up hill and down, cross country at an exhilarating 30 mph (or better), into territory that used to be off limits when the snow flew. You can hunt and fish with a Skee-Horse, go camping with it, pull skiers with it. Some folks even hold Skee-Horse rallies and steeplechases. It opens a whole new range of winter pleasures — so get with it. Before the woods are full of bears on Skee-Horses.

CLOSE-UP REPORT **Johnson Skee-Horse**

3 models: 15½" and 20½" tracks, 20½" track with electric starting. 14 hp engine with Torque Sensitive Drive — gears itself to hill and load demands. New Snow-Claw traction with more track-to-

snow surface, improved flotation. Power train arctic-proved to 50° below. New cushioned ride. Positive disc brake. Exclusive lock-out neutral. Trailers like a boat — only easier!

Write for FREE 24-Page "FUN GUIDE TO SNOWMOBILING"

Johnson Motors, Dept. PM-62, Waukegan, Illinois 60085 • Division of Outboard Marine Corporation

POPULAR MECHANICS

CHRISTMAS

SHOPPING GUIDE

HEAR TWO-WAY CONVERSATIONS WITHOUT PICKING UP RECEIVER TELEPHONE MONITOR



Just place this tiny unit against back of phone and you'll pick up everything clear enough to record it. Pretty sly little gadget, an outgrowth of one made for the military. Fits in pocket without a bulge. Think of the fun with this one. \$18.95 ppd. ADF Co., Dept. PM, 125 East 41st St., N. Y. 17.



1896 ENGLISH LIVE-STEAM TRACTOR

made in England, with brass boiler, cylinder and pistons, copper steam pipes, steel fire box, axles and shaft. Travels 1/3 mile in 10 minutes. develops strong 1 1/2 h.p. at 3000 rpm, adds realistic power to any stationary model. Uses alcohol, 1 ft. long. \$35 and worth it! Antique Toy Co., Dept. PM, 122 East 42nd St., N. Y. 17.

GIANT 12 FT. METEOROLOGICAL BALLOON



Playing with one of these is great fun! Brand new government surplus, it's made from durable neoprene rubber, easily inflates with gas or air to 12 to 18 ft. Fine as advertisement at openings, sports events, etc. \$2.95 ppd. Day Co., Dept. PM, Box 311 Grace Sta., N. Y. 26.

U.S.A. CAMP MACHETE



\$295 ppd.

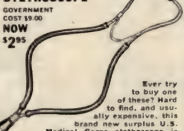
You don't have to cross the border to get one of these 18" blade machetes. War surplus (Army made 3 million in World War II), you can bush out a trail, clear a camp site, or fell a good-size tree with one. In sturdy canvas sheath with belt clip, it's a solid buy for \$2.95 plus 35¢ postage. Arms & Weapons, Dept. PM, 380 Lexington Ave., N. Y. 17.

OLD-TIME BUGLE HUNTING HORN



Genuine old-time, bugle-type hunting horns are crafted from select steer horns. Imported, horns are hand-polished, come with rawhide shoulder thong. You don't see many of these today, and this one is a beauty. Has a clear bell-like tone, measures 14" along the curve. \$3.95; 16" horn, \$4.95 ppd. Lee Products, Dept. PM, 103 Park Ave., N. Y. 17.

U.S. MEDICAL CORPS STETHOSCOPE



GOVERNMENT
COST \$9.00
NOW
\$2.95

Ever try to buy one of these? Hard to find, and usually expensive, this brand new surplus U.S. Medical Corps stethoscope is used by doctors, nurses, students, is perfect for learning rudiments of the respiratory system. Use it to detect motor trouble in your car, etc. \$2.95 ppd. (1/3 regular price.) Klines, Dept. PM, 333 East 50th St., N. Y. 22

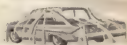
Our Lowest Price ever on a PORTABLE GARAGE

All-Weather Protection for Car, Truck, Boat . . . Outdoor Furniture, Tools, etc.

HEAVY DUTY

\$2.79

plus 41¢
postage



Heavy gauge clear plastic protects against sleet, snow, hail, dust, salt air. Extra durable: stays pliable even at 60° below zero. Huge 12' x 25' size folds easily, goes on and off in a jiffy. Pays for itself with savings on rust, repairs, repainting, etc. Send check or M.O.; no C.O.D.'s. Money-back guarantee. SUPER DUTY with 8 grommets. \$5.29 plus 71¢ post.

BARCLAY, Dept. 59-MG

170-30 Jamaica Ave., Jamaica, N.Y. 11432

Bean's

Maine
Hunting
Shoe

For bare ground and snow hunting. Light as a moccasin with the protection of a heavy hunting boot. Tan Elk-Tanned Cowhide top, guaranteed not to harden. gum rubber vamp and non-slip rubber sole. Split back-stay prevents chafing.

Price Postpaid
6 inch . . . \$12.85
10 inch . . . 14.85
12 inch . . . 17.35
Heights 9" to 10"
Whole sizes only
3 to 14, D,
EE, and FF.



L. L. Bean, Inc.

362 Main St., Freeport, Maine 04032
Hunting, Fishing and Camping Specialties

NEL-KING MAGNA-FI

makes close work, fine print look big!

FOR CRAFTSMEN,
HOBBYISTS,
TECHNICIANS,
HOMEMAKERS...

People of all ages! You see clearer, work faster and more accurately with less tension, less strain, less fatigue. MAGNA-FI is a precision optical instrument with finest ground and polished prismatic lenses. Can be worn with or without glasses . . . even bifocals. Adjusts comfortably to any head size. Leaves hands free to work. Only \$7.95 postpaid with removable 2½ diopter lens. An extra, more powerful 3 diopter interchangeable lens available at \$2.98 additional. Exclusive Feature: Hinged lens swings up out of the way when not in use. GUARANTEED: Money back if returned postpaid in 30 days.



Nel-King Products, Dept. PM-115MF
811 Wyandotte, Kansas City, Mo.

NEW IDEAS BY MAIL FROM SUNSET HOUSE



848 SUNSET BUILDING
BEVERLY HILLS, CALIF. 90213



LOGS FROM NEWSPAPERS! Roll your own fire "wood" at no cost! Easy-to-use Log Roller turns a folded stack of newspapers into a compact solid-core cylinder... smokeless because air circulation passages are formed as they're rolled, 12 Log Ties included. Supply of 100 in extra Ties Pack.

- 7232 — Log Roller \$1.79
7297 — Log Roller Ties Pack \$1



1000 HANDY LABELS... printed with your own name and address! So practical... they can be used on stationery, envelopes, photos, records, checks, book, greeting cards. Any message up to 3 lines is printed on 1000 high quality gummed labels, packed in handy plastic box.

- F-1500 — 1000-Handy Labels \$1
2 packs for only \$1.87



BOWLER'S NAME TOWEL — distinctively personalized in colorful embroidery stitching. The perfect gift for every alley addict! Absorbent Terry Towel is handy during a game... and just the right size to carry in a bowling bag. No one else can accidentally make off with a Towel that's so positively identified. A show-off

gift that is guaranteed to delight your bowling friends. Be sure to specify first name or nickname desired for special lettering.

- P-4261 — Bowler's Towel \$1



WORLD'S TINIEST RADIO! No bigger than a match box, but it pulls in news, music, sports! You may not get every station, but look! — no batteries, no tubes to wear out! So economical! Works on station energy — picks up signals with a germanium diode. Fits pocket or purse... complete with ear speaker for personal listening.

- 7197 — World's Tiniest Radio \$1.98



24 CREDIT CARDS — NO FUMBLING! Turn instantly to the proper identification when you carry this pigskin folder personalized with a 23K gold monogram. Displays 24 cards and photos in window envelopes — 6 pockets for money, checks, papers... yet fits a man's pocket without a bulge. Please specify initials for personalization.

- C-6874 — Credit Wallet \$2.98



WOW! NUDIE ICE CUBES give a real frosty tang to drinks! Specially designed ice cube Tray turns out a bevy of four bountifully proportioned beauties. These girls are guaranteed to cause conversation as well as give frosty delight. Sensational party idea! You can't miss with a gift like this!

- 3444 — Nudie Cubes Tray \$1
3 for only \$2.79



IT'S CORDLESS! TINY POWER DRILL is great for hobby-craft and fixit jobs! Use it anywhere. Handy for model making, repairing toys, jewelry. 10,000 rpm speed for use on wood, metal, plastics. Comes with .032 and .0375 drills, plus sanding drum, router, deburring tool. Styrene case. Powered by standard C batteries available everywhere.

- 7590 — Power Drill \$3.98



AUTO VACUUM BRUSH keeps your car clean! Just plug it into your dashboard lighter receptacle... no batteries needed! For 12-volt systems. 9-ft cord reaches every corner of your car. Pick up ashes, crumbs, dirt and dust right now — not on some distant clean-up day. Vacuum bag empties easily. Bulb in back makes it a handy flashlight!

- 4891 — Auto Vacuum Brush \$4.98



LET YE TISSUE GREETINGS ROLL! 'Tis the ho-ho season and what makes the laughter ring faster than toilet tissue gaily decorated with comic holiday cartoons! The perfect way to show guests there's no end to your hospitality. 100 Greetings on a Roll... white paper with red and green printing.

- 7580 — Christmas Tissue 59¢
2 for only \$1

MAIL THIS HANDY ORDER FORM TODAY!

SUNSET HOUSE

848 SUNSET BUILDING, BEVERLY HILLS, CALIF. 90213



NAME _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____
AIR MAIL REACHES US OVERNIGHT ▶

ITEM NUMBER	HOW MANY	ITEM	PRICE

Orders sent Postage Paid.
No C.O.D.'s, please.

TOTAL AMOUNT ENCLOSED

Genuine Leather

Leisure Time
MOC!

\$179

youth
sizes

Palomino
color
\$2.39 adult sizes (each kit contains 1 pr.)



Easy as pie to make. All you do is lace and you have a comfortable leather moc with thick foam rubber insole. \$5 value completed. Order by shoe size. Send check or m.o., size, name and address to: (add 25c for postage and handling)

TANDY LEATHER

1001 Foch Dept. RL, Ft. Worth, Tex. 76102

EXCLUSIVE 3-WAY HEAVY KNIT
HOOD, HAT OR UNDER CHIN

BRAND NEW **Storm Hood**



\$1.19

plus 15c
postage

6 for \$7 ppd.

Warm wool in black or red. Protects head, mouth, neck and ears, keeps out cutting wind and biting cold. Fits men, women, children. Available only by mail. Money-back guarantee.

BARCLAY DEPT. 59-M5

170-30 Jamaica Ave., Jamaica, N.Y. 11432

Bean's

Free
Catalog

Choose "out of the ordinary"
Christmas Gifts



Hunters, Campers and Fishermen will find many practical items in our fully illustrated Catalog. Shows hunting footwear, clothing and other specialties of interest to both men and women. Many items are of our own manufacture.

L. L. Bean, Inc.

362 Main St., Freeport, Maine 04032
Hunting, Fishing and Camping Specialties



EYEGLASS COMFORT PADS

Makes old glasses fit like new. Nel-King Comfort Pads keep your glasses in place no matter how active you are or how freely you perspire. Fits all sizes. Apply in seconds to nose piece or stems. Ends unsightly red marks. Great for sunglasses, too. 42 pads only \$1.00 ppd. Nel-King, Dept. PM-115E, 811 Wyandotte, Kansas City, Mo. 64105.

Bean's

Insulated
Hunter's
Hat



Shell of water repellent cotton poplin. Fully lined with quilted thermofloam rubber. Warm and retains hat shape. Stitched brim. Lined neckband and earflaps fold inside hat. Handwashable. Colors: Hunter's Scarlet, Olive Green. Sizes 6 3/4 to 7 3/4. (Order 1/2 size larger than regular.) Price, \$3.70 postpaid.

L. L. Bean, Inc.

362 Main St., Freeport, Maine 04032
Hunting, Fishing and Camping Specialties

**HANDEE® TOOL OF
1001 USES**



cut, carve, sand, saw, grind, drill, engrave, polish, clean
Weights only 14 oz. 28,000 R.P.M. Fully guaranteed against defects in material and workmanship. 110-120 volt AC/DC or 220-250 volt AC/DC.
No. 6000 Handee Grinder with 3/8" collet, 1/8" collet, and wrench, \$25.95. No. 6009

with 7 accessories, \$26.95. No. 6010 with 45 accessories and case, \$39.95. Write for Handee Catalog.

CHICAGO WHEEL & MFG. CO.
Dept. A, 1101 W. Monroe St., Chicago, Ill. 60607

Let's Do LEATHERCRAFT!



HERE'S A GENUINE
LEATHER BILFOLD
KIT AS A STARTER

ONLY
25¢

Choice of men's style, with 5 pockets or ladies' with 6 pockets and coin purse. Kit complete. Ready to assemble. Design embossed. So easy a child can do.

WORTH
\$3.50
COMPLETED

WRITE
TODAY

Send 25c. name, address and choice of styles to:

TANDY LEATHER COMPANY

1001 Foch St., Dept. RL Fort Worth, Texas 76107

**CATCH THEM ALIVE
AND UNHURT!**



Amazing HAVAHART trap captures raiding rats, rabbits, squirrels, skunks, weasels, etc. Takes mink, coon without injury. Straining pets, poultry released unhurt. Easy to use—open ends give animal confidence. No springs to break. Sizes for all needs. FREE booklet on trapping secrets.

HAVAHART, 136-N Water St., Ossining, N.Y. Please send FREE 48-page booklet, price list.

Name
Address

See
More
Clearly

Read
Fine
Print

Slip-On Magnifiers—\$2.98

Having trouble seeing fine print and close work? Slip these magnifiers on your prescription glasses and SEE CLEARER INSTANTLY! Powerful 2 1/2 diopter lenses. Fits all glasses. Low \$2.98 price saves you 25%. State age. If not satisfied, return postpaid in 30 days for refund. Add 25c postage.

NEL-KING Prod., Dept. PM-1155

811 Wyandotte, Kansas City 5, Mo.

READY? ALWAYS!



Only
\$349
P.P.

Magnetically hung on new MAGNAGRIP MARK X Handy, or dolly, safe. MARK X holds any metal tool. Mounts on wood, plaster or metal easily. Smartly styled in white. Gift boxed.

Only
\$198
P.P.



MAGNAGRIP SOAP HOLDER
Soap hangs in air—right where you want!

Just two of Magnagrip line of work-savers. Guaranteed or money back. Send check to Dept. B

PHILON MAGNAGRIP COMPANY, INC.
East Longmeadow, Massachusetts

RECHARGE Used BATTERIES

as many as 15 times for
LESS THAN 1/4c per RECHARGE

The miracle Dynamic Home Battery Charger brings used batteries back to full cranking power. Recharges any make, any size, any type. Completely shock-proof, charges only with lid closed. Plug into any AC outlet charge up to 4 batteries at one time. Pays for itself in battery replacement savings.

UL approved. Send check or M.O. to: No C.O.D.'s. Guaranteed for replacement or repair for 1 year.



\$5.95
ppd.

Hearing Aid Battery Adapter... \$3.98 ppd.

BARCLAY, Dept. 59-MB

170-30 Jamaica Ave., Jamaica, N.Y. 11432

FREE

CHRISTMAS
"MAKE-IT"
BOOKLET



Idea packed for men, women and children. Shows molds, ashtrays, tree and table ornaments, other lovely gifts; mosaics, plastic casting, candles, copper enameling.

Write Today

AMERICAN HANDICRAFTS

1001 Foch, Dept. CW, Ft. Worth, Tex. 76107

**FLASH
NEWS!**

AUTO REPAIR Bulletin

EXTRA!
★ ★ ★ ★ ★

Published by the Automotive Experts of MOTOR's Manual

AMAZING FREE OFFER PROVES YOU CAN FIX 2,341 CAR MODELS!

OVER 5
MILLION COPIES
ALREADY SOLD!



**MOTOR's Manual Shows Green Beginner and Skilled Mechanic
Alike How To Do Just About ANY Job Quick, Easy, Right the First Time!**

USE FAMOUS MOTOR's Manual for ten days at our expense. See how its giant "Trouble-Shooter" section pinpoints 2,300 car troubles right away. Then see how it shows you where to start, what tools to use, how to use them.

If MOTOR's Manual doesn't make even the toughest jobs A-B-C Easy—if it doesn't pay for itself the first 2 times you use it—simply return it and pay absolutely nothing. That's how confident we are that THIS Manual really works! Beginners turn into skilled mechanics,

experts get many valuable time- and money-saving tips. Crystal-clear directions and 3,600 big photos, diagrams, charts, etc. You CAN'T go wrong!

The "Meat" of 300 Official Shop Manuals

You get a wealth of "Know-How" from 300 Official Shop Manuals and hundreds of Factory Bulletins, boiled down into one giant easy-to-use book. No more guesswork. You use same procedures as "pros" to do every job quick, easy, right the first time.

Look At All You Get:

Over TWELVE HUNDRED giant pages. 3,800 "This-Is-How" pictures. 457 Quick-Check charts. 55,000 Essential repair specs. Over 225,000 service and repair facts. PLUS adjustment tables, measurements and clearances, overhauling and replacement facts, tune-up data, much more! Covers every one of 2,341 popular make models built since 1958—including the new 1965 models!

DO JUST ABOUT ANY REPAIR JOB...



QUICK, EASY, RIGHT the first time!

Everything from tune-ups to transmission overhauls

Using new, revised MOTOR's Manual is like having factory experts themselves standing right beside you, guiding your hands through every job. You get big illustrated sections covering every one of 37 car makes—plus detailed chapters on transmis-

sions, rear ends, alternators, generators and regulators, fuel pumps, ignition systems, overdrives, automatic transmissions, engines, brakes, valves, rings, water pumps, distributors, dash gauges, power steering, power brakes, starting motors, etc.

"Inquiring Photographer"

Q. What Do You Like About
MOTOR's Manual?



HELPS HIM MAKE FOREMAN.
"Your Manual helped me make foreman. And I find it helps the boys working for me. We are always referring to the Motor Manual."

—J. A. Bowerman, California
Trucking Shop Foreman



MOTOR IS HIS "BIBLE." "We consider MOTOR here as our Bible. It has pulled us out of many rough spots."

—E. A. Kneer, New York
Service Station Owner



EXPERT PROFITS . . . "I've done mechanic work for over 25 years. Motor has saved many hours . . . worth its weight in gold."

—R. Carter, N. Carolina
Auto Mechanic



. . . SO DOES STUDENT. "In school where I learned the trade, Motor's Manual pulled me out of rough spots."

—W. Bekemerer, Missouri
Student Mechanic



FIX THESE CARS FAST — 1958 thru 1965 — PLUS NEW SECTION ON VOLKSWAGEN!

American
Barracuda
Buick
Buick Special
Cadillac
Chevelle
Chevy II
Chrysler
Comet
Continental
Corvair

Corvette
Dart
De Soto
Dodge
Edsel
Fairlane
Falcon
Ford
Imperial
Jeep
Lancer
Lincoln

Mercury
Meteor
Mustang
Oldsmobile
Olds F-85
Plymouth
Pontiac
Rambler
Studebaker
Tempest
Thunderbird
Valiant

Used by
U.S. Army & Navy
and Thousands of
Service Stations
and Repair
Shops

**USE MANUAL FREE
FOR 10 DAYS**

FREE 10-DAY TRIAL OFFER

Just mail the coupon below. We'll rush Manual to your home or shop. Use it FREE for ten days! See if it doesn't help you whiz through even the toughest jobs. If Manual doesn't pay for itself in the first ten days, return it and pay nothing. Otherwise, so mail the No-Risk coupon AT ONCE to: MOTOR Book Dept., 250 West 55th Street, New York 10019. (SCHOOLS, BOOKSTORES: Write for discounts.)

MAIL COUPON NOW FOR 10-DAY FREE TRIAL (Attach to Postcard for Fast Action)

MOTOR BOOK DEPT., Desk 54X
250 W. 55th St., New York, N. Y. 10019

☐ Rush to me at once MOTOR's NEW AUTO REPAIR MANUAL. If O.K., I will remit \$2 in 10 days, \$3 monthly for 2 months as a final payment of \$1.95 (plus delivery charge and sales tax, if any) one month after that. Otherwise I will return the book postpaid in 10 days.

Print Name.....Age.....

Address.....

City & State.....Zip.....

☐ If I don't like it, I will return it for a full refund. If I like it, I will remit \$1.95 (plus delivery charge and sales tax, if any), in 10 days. Otherwise I will return book postpaid in 10 days.

☐ Check me and HAVE delivery charge by enclosing WITH coupon in envelope payment of \$9.95 for Auto Repair Manual (or \$11 for Truck Repair Manual) plus sales tax, if any. Same return-for-refund privilege.

Same FREE Offer on MOTOR's New TRUCK REPAIR MANUAL



Covers 98% of all trucks. 1955-1965, including all new economy models. Over 2,000 illustrations: 300,000 facts. Easy to use. Covers all gasoline engines, plus Cummins, Mack, Ford, GM, Inc., Perkins diesels. Over 1,000 pages! For 10-day FREE trial, check proper box in coupon.

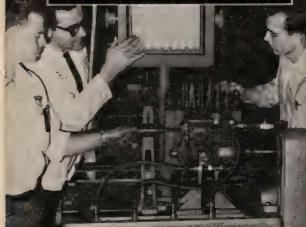
BY KEVIN V. BROWN

AVIATION

JETSTREAM

EARN WHILE YOU LEARN DIESEL AUTO MECHANICS and AUTO BODY

**LATEST DIESEL FUEL PUMP
CALIBRATING MACHINE**



Prepare NOW for **BIG PAY JOBS** in industry or ratings, with **MORE PAY**, in the service.

96.4% graduates placed in big paying jobs! Start about \$5,000 a year... rapidly advance to \$10,000 a year. Earn to \$2,200 a month if you start your own business with 75% financing!

More **BIG PAY JOBS** than we can fill. Let us show you actual waiting list of Diesel dealers who have tried Bailey graduates, found them outstanding & keep coming back for more.

Both DIESEL & AUTO training for PRICE OF ONE!

See the most beautiful school in the country with best equipped modern shop.

Get free booklet showing step-by-step tour thru our big shops. See students as they Learn-By-Doing with Famous Bailey Method of training. Housing & part time jobs provided—national placement for graduates.

BAILEY Technical SCHOOLS

1645 S. GRAND Dept. PM ST. LOUIS 4, MO.

MAIL TODAY FOR FREE BOOKLET

- ☐ DIESEL MECHANIC
- ☐ AUTO MECHANIC
- ☐ MASTER MECHANIC
- ☐ AUTO BODY



Name _____

Address _____

City _____ State _____

Telephone _____ Age _____

President Johnson, in announcing the go-ahead for the Air Force's manned orbital laboratory (MOL), created a long-awaited breakthrough on two fronts.

He approved, for the first time, sending military personnel into space on a military mission, and he opened the door for the re-creation of the U.S. Air Force as the U.S. Space Force, or perhaps Aerospace Force.

The MOL, which in preliminary drawings resembles a huge boiler, will be about 10 by 40 feet, big enough for walking room—or, in the weightless condition, floating room. The first tests will probably send two men into orbit for 30 days. The ultimate purpose is to find out what a military man is capable of in space.

The whole idea has been something of a political football. Some officials felt space should be left for peaceful purposes. Others felt that if we didn't send military men into space, with defense of the United States in mind, someone else might send their military men up with destruction of the United States in mind.

The new role gave new hope to the Air Force which, although less than 20 years old, was in some danger of becoming obsolete or at least being reduced to a minor role. Missiles have taken over many of the chores once performed by its fighters and bombers, and many of its pet projects, like the *Dynasoar* and the XB-70, have been cancelled or curtailed drastically. The F-111 is the first new frontline Air Force aircraft in almost 10 years.

Its Space Pilots' School has already contributed two astronauts (McDivitt and Borman) to NASA space missions. Now it may find roles for the others itself. The sky itself is the limit.



AIR FORCE MOL will be first military space mission

WIN! *the* *Black & Decker*® DREAM WORKSHOP

Here's a handyman's dream come true! You could be the winner of this marvelous Dream Workshop. It's a duplicate of the House of Good Taste workshops seen by millions at the New York World's Fair. It's chock-full of Black & Decker and DeWalt power tools and accessories, plus all the hand tools any workshop needs. There are 1,149 other great prizes, too. Just

fill out the entry form attached and take it to your Black & Decker or DeWalt dealer for validating. If the entry form has been removed, your dealer has additional ones. Enter often as you wish. Also, he can show you the Black & Decker power tools you would want for your Dream Workshop—winner or not. Black & Decker, Towson, Maryland, 21204

GRAND PRIZE

"DREAM WORKSHOP" (PICTURED BELOW) INCLUDING ALL THESE POWER TOOLS—

DeWalt 10" Deluxe Power Shop with 14 accessories • New $\frac{3}{8}$ " Deluxe Variable Speed Drill with bench stand • Black & Decker $\frac{1}{4}$ " Cordless Drill with Power Pack and Charger • New Professional Jig Saw Kit with 15 extra blades • $7\frac{1}{2}$ " Deluxe Circular Saw with case, cut-off guide and 5 blades • New Dual Action Finishing Sander with dust collector and 30 abrasive sheets • Professional Belt Sander • 11-piece Router Kit • $\frac{1}{2}$ " Reversing Drill with drill press stand • Cordless Hedge Trimmer with Power Pack and Charger • and the Black & Decker Deluxe Lawn Edger & Trimmer with 100' extension cord. Also included are 40 drill accessories, 40 hand tools and all the Dream Workshop cabinets and wall units you see in the picture (designed by Popular Science for Black & Decker).

1149 OTHER GREAT PRIZES! 11 2nd Prizes • 88 3rd Prizes • 300 4th Prizes • 750 5th Prizes





**Announcing America's
Total Performance Cars
for 1966**

**1966
Ford**



1966 Fairlane 500 XL Hardtop

**1966
Fairlane**

Fairlane re-invented . . . still the rugged, reliable family car, but with all-new performance for '66! What's new? New models—13 in all. New power. A whole

new look! New Fairlane convertible, XL, GT and GT/A series. New paneled Fairlane Squire. Fairlane is a family car—for very lively families!



PRODUCTS OF


1966 Ford LTD 2-door Hardtop

Quiet Quality, Powered by Ford! Its quiet says quality and "Powered by Ford" says performance! Here's the news in Ford for '66: new optional Stereo-sonic Tape System

• new front power disc brakes • new Magic Doorgate for wagons • new 7-Litre high performance series • 19 lively, luxurious new '66 Fords to choose from—drive one today!



1966 Falcon Futura Sports Coupe

1966 Falcon

America's Economy Champ—now on its third million—with a sporty new look! Falcon '66 is the strongest, roomiest, best-looking, smoothest-riding compact car we've ever built... and still Falcon-low in price!

1966 Mustang

If you thought we couldn't improve on a winner—try Mustang '66! The changes are subtle but significant. Bright new grille. New Stereo Tape option. Plus all the features that made Mustang a record-breaking success.



1966 Mustang Hardtop

AMERICA'S
 TOTAL PERFORMANCE CARS

FORD
 MUSTANG • FALCON • FAIRLANE • FORD • THUNDERBOLT



**This is a GM Original:
It has a tough job to do.**



**This is a GM Replacement:
It's every bit as tough.**

And, of course, that means one thing: When a genuine GM part comes out, be sure a genuine GM part goes back in. The kind that looks, acts and is just like the GM Original.

Whether you're talking about the tapered pinion bearing that helps transmit power to

your car's rear wheels, or any *other* important part of your car or truck.

Still another advantage—you can find them anywhere you drive. Go where you know they use them. Ask for Genuine General Motors Parts in the GM and United Delco packages.

GENUINE GENERAL MOTORS PARTS



CHEVROLET • PONTIAC • OLDSMOBILE • BUICK • CADILLAC • GMC TRUCKS

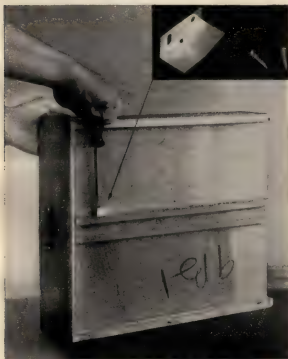
United
Delco



EXCITING NEW PRODUCTS



Spray 'n Glide is the first Teflon lubricant in an aerosol can. Unlike silicones or graphite (which can stain), Teflon becomes a clean, dry, stainless powder as its solvent evaporates—yet it lubricates practically *anything*. About \$1.98. Saber Products, 225 Hoyt St., Mamaroneck, N.Y.



Werloc "child-proofs" drawers. It's a simple metal fitting that screws to the underside of a drawer, keeps it locked until you're ready to open it. Drawer is opened by raising it slightly, then pulling it out. Six for \$1.98 ppd. from Werloc Quality Products, P.O. Box 596, Goleta, Calif.



Start something fresh!

Freshest smoke you ever
put into a pipe

BOWL of ROSES

Aromatic Mixture

You never thought a rich, satisfying smoke could be so *fresh*! An outdoor kind of freshness you get only in Bowl of Roses...because only Bowl of Roses blends this bouquet of flavor with its hearty, satisfying tobaccos.

Try Bowl of Roses for your next pipeful. Start something *fresh*!...she'll like it almost as much as you do.



Another fine product of United States Tobacco Company

CAREER BAROMETER

BY CREIGHTON PEET

RIGHT NOW, mechanical engineers—and the entire train of jobs they carry with them—seem to occupy one of the brightest spots on the career horizon. Why? Because they're needed by a booming U.S. industry for everything from electric toothbrushes to jet engines for the new 700 man transport planes—to say nothing of our fantastic manned orbital laboratory and other space projects. It's quite a range.

What's more, says John Hall, General Electric's manager of technical recruiting for the southeastern region, we're in a new cycle: the Government is busily buying *hardware* rather than pouring the horn of plenty into research for devising new systems. The big need now is for mechanical engineers in design and pro-

duction areas. This means that the straight research and development men will not be as much in demand for awhile as they were, say, a year ago. The huge demand for hardware, which should benefit all mechanical men, includes not only tanks and other war materiel for Vietnam, the 700-man transport plane, and the much-discussed supersonic plane, but a vast number of small consumer items.

In current military hardware there is less demand for electrical and electronic men. Because of the nature of the war in Vietnam we can not use some of our most advanced materiel, older items are often more useful.

This trend to continue the production of
(Please turn to page 46)

JOB TITLE	CURRENT DEMAND	3-MONTH TREND	STATES WITH HIGHEST DEMAND							
Chemists, Biolog.	28	Slightly less demand	N.J. 7	N.C. 2	Pa. 2	Ohio 2	Minn. 3			
Chemists, Organic	51	Slightly less	Conn. 4	N.J. 9	Calif. 9	Ala. 11	Ohio 3			
Chemists, Inorganic	7	Slight increase	Conn. 1	Ala. 2	Mo. 1	Colo. 1	N.M. 1			
Engineers, Metall.	49	Some increase	Conn. 5	D.C. 6	Pa. 3	S.C. 10	Ind. 6			
Engineers, Civil	447	Substantial increase	Conn. 30	N.Y. 52	D.C. 66	Calif. 58	Wash. 33			
Engrs. Elect. & Electron.	879	Demand steady	Conn. 46	Calif. 219	D.C. 52	Fla. 96	Miss. 52			
Engrs. Industrial	290	Good increase	Conn. 21	N.J. 29	D.C. 22	Wash. 20	Miss. 23			
Engineers, Mechanical	1,055	Very heavy increase	Conn. 67	N.J. 59	Calif. 180	Pa. 70	Ohio 57			
Engineers, Aero.	494	Good increase	La. 17	Calif. 123	Wash. 120	Miss. 153	Mo. 140			
Engineers, Mining	14	Good increase	D.C. 3	Pa. 4	Fla. 1	Minn. 4	Calif. 1			
Nat. Scientists	100	Slight decline	N.J. 4	D.C. 18	Va. 5	Ohio 4	Wash. 51			
Draftsmen, Arch.	37	Some decline	Conn. 2	Mass. 3	N.J. 3	Pa. 3	Mich. 9			
Draftsmen, Elect.	65	Very good increase	Pa. 6	Fla. 5	Ill. 4	Mo. 20	Calif. 20			
Draftsmen, Mech.	185	Substantial decline	Pa. 34	Ohio 37	Ill. 11	Wis. 27	Mo. 10			
Draftsmen, all other	195	Substantial decline	Conn. 15	Ga. 13	Miss. 21	Mo. 20	Calif. 36			
Tool Designers	114	Substantial increase	Vt. 10	Pa. 4	Ill. 10	Wis. 5	Wash. 60			
Lab. Tech. & Assts.	93	Heavy increase	Conn. 6	Mass. 5	Fla. 7	Miss. 15	Ind. 13			
Sports Instr. & Officials	48	Good increase	Conn. 6	N.Y. 7	Va. 3	Fla. 2	Colo. 25			
Surveyors	23	Less demand	N.J. 2	N.C. 3	Ill. —	Iowa —	S.D. 6			
Techs., Engrs., Phys. Sci.	318	Some little increase	Ala. 52	Fla. 26	N.M. 10	Ariz. 4	Wash. 202			
Tool Planners	12	Demand doubled	Miss. 3	Ohio 2	Ill. 7	—	—			
Systems Engineers	22	Demand steady	N.Y. 1	Pa. 1	Fla. 2	Ill. 1	Mo. 15			
Programmers	276	Substantial increase	N.J. 7	D.C. 24	Mo. 11	Calif. 61	Wash. 118			
Systems Analysts	78	Demand steady	Conn. 4	D.C. 5	Mich. 4	Calif. 14	Wash. 35			
Inspectors, Pub. Service	9	Good increase	Md. 1	Calif. 2	Alaska 1	Wash 5	—			

PM's Career Barometer Chart, above, gives the actual number of men currently needed for specific jobs. "Current Demand" figures are true as of our closing date. Check this chart each month and it will tell you where your talents are needed, and how badly. For names of actual employers represented by these listings, contact the state employment agency in the cap-

ital city of the state indicated. Mention that you saw this in **POPULAR MECHANICS**.

Today, with proper schooling, you can qualify for many of the job categories shown. For a list of accredited correspondence and residence schools, write to **POPULAR MECHANICS' Information Bureau, 575 Lexington Ave., N.Y., N.Y. 10022.**

JAMES BARGER EARNS while he LEARNS

UPHOLSTERY!

UPHOLSTERY FITS YOUR BILL

You don't even need to quit your present job. You start learning at home, spare time, immediately. Within two weeks you are able to do profitable jobs!



MAKE YOURSELF A WHOLE ROOMFUL OF BEAUTIFUL FURNITURE WHILE YOU LEARN — YOURS TO KEEP OR SELL!

AVAILABLE WORK RUNS TO MILLIONS!

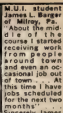
Sofas, sectionals, arm-chairs, foot-stools, built-ins, breakfast nooks — all upholstery, drapes, cushions — all upholstery in cars, trailers, slipcovers, campers — there is never an end to it! There's a real gold mine in making old, worn out, worthless furniture into something new, appealing, modern and depression proof industry! Men, women or family teams, all ages, make big money in upholstery. Trained upholsterers are scarce, earn top money, are needed everywhere!

FREE BOOK

Free book gives you about 140 complete and reliable step-by-step instructions never compiled on the amazing field of Upholstery. Start in your home or garage... in spare time. Start small, GROW BIG! As it takes in a weekend or better, head home NOW!

LIFETIME SECURITY • BIG PROFITS

No Ceiling on your Income • These are yours in **UPHOLSTERY!**



M.U.I. student James L. Barger of Milroy, Pa.

"About the middle of the course I started receiving work from people around town and even an occasional job out of town. At this time I have jobs scheduled for the next two months!" Sincerely, James L. Barger.

TAKE YOUR CHOICE!

1. Skilled upholsterer in shop or factory, top wages.
2. Home-Garage reupholstering business of your own, independent, top earnings.

UPHOLSTERY WORK INCREASES "LIKE MAGIC" when you combine know-how and ambition! James Barger found it out. So can you! Why work for a low weekly paycheck? Get off that treadmill through UPHOLSTERY! Here's the way you can do it!

Here it is! You have nothing to lose and a lot to gain!

MAIL This Coupon TODAY!!

Mr. Harvey Emerson, President
Modern Upholstery Institute, Box 899-RB, Orange, Calif.
Dear Mr. Emerson: Please send me your big free and postage prepaid Upholstery Guidebook and sample lesson. No salesman will call.

NAME _____ AGE _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____

BE YOUR OWN BOSS

It's great. Work your own hours. Live better than ever before and still watch the bank account grow. Move to other cities if you like or live in a small town, beach, resort. Upholstery is everywhere. You can carry a good income for life around in one small suitcase when you are in UPHOLSTERY!

Approved by Association of Home Study Schools. M.U.I. is authorized by the Supreme of Public Instruction to grant a diploma in Upholstering.

Save Money on WOOD

Hardwood Veneers . . . Hardware . . . Wood Shop Supplies and Equipment . . . Power Tools



New Catalog
over 1500 items
Now Ready!

Hardwoods, Fine Plywoods, Inlays, Mouldings, Mosaic Tile, Tools, Lamp Parts, Upholstery Supplies

Your new MONEY SAVING wood and workshop buying guide now ready! 140 page. Full color! Your best "one stop" source for finest kiln dried domestic and imported hardwoods, veneers, plywoods, modern and traditional legs . . . over 1500 items.

STANLEY TOOLS at Discounts
Starting savings on top name power tools, hard to find cabinet hardware, lamp and upholstery supplies. New projects and kits. Enclose 35¢ to help pay mailing and handling costs. Mail coupon.

CRAFTSMAN WOOD SERVICE COMPANY

2729 South Mary, Chicago, Illinois 60608. Dept. A-115
Rush new Craftsman WOOD Catalog. I enclose 35¢ to help pay mailing cost.

NAME _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____

FREE Key Machine

Kind master locksmiths use. Sells for \$125, but yours FREE with Locksmithing Course



You Can Learn To Be A LOCKSMITH in your spare time

There's a big demand for skilled locksmiths. You can earn big money either full or part-time in your own home. Be your own boss; earn steady, year 'round income with no layoffs. The BELSAW INSTITUTE training, recommended by professional locksmiths, teaches you to make keys, open and repair locks on homes, cars and buildings. Easy, step-by-step illustrated lessons complete with all tools and supplies. We tell you how to get servicing jobs, how much to charge, how to earn while you learn and how to build a secure cash profit business.

Mail Coupon for FREE Book Today!

BELSAW INSTITUTE, 106E Field Bldg., Kansas City 11, Mo.
Send FREE book, "Keys To Your Future!"
No obligation. No salesman.

Name _____
Address _____
City _____ State _____

YOU, TOO, CAN BE
YOUR OWN BOSS,
WITH

the right "starter set!"

FOR YOUR OWN BUSINESS,
ALL READY-TO-GO!

yes — you can ease into your own business... and for less than the cost of a new compact car! Let's say you have everything it takes — sales fever, drive and a willingness to work hard for your own company. Still, the agony of the start-up is holding you back. Why shouldn't there be a "starter set" for a man like you?

There is. ServiceMaster makes it possible for men like yourself to start-up in business on a practical basis. We have put literally hundreds of men into their own businesses — in the homecare and office maintenance field. We give them complete training, all the necessary equipment, products and marketing know-how, at a very moderate investment.

To bring this about, we are offering what can be called "A Starter Set For A Business Of Your Own." It gives you the world-famous banner of the world's largest system of professional cleaning services, the working know-how, products, equipment, and a full-time counseling service to lead you to the success you want.

We're interested in the man who really ought to be running his own business, but needs a ready-to-go plan. If you are such a man, better write for full information without obligation — right away.

Write to:

ServiceMASTER®

E. F. Morgan, Jr., Vice-President
2300 Warrenville Road, Dept. 803
Downers Grove, Illinois 60515

CAREER BAROMETER cont'd

existing designs will also be seen in some civilian lines, Hall believes, since our present prosperity is causing an increased demand for everything from cars to boats. As a result, a good proportion of General Electric's men will at times cross over from the electrical field to the mechanical—and in some cases will stay in this field. The reverse was true when a mechanical man ventured briefly into electronics to develop a magnatron small enough to go into an electronic oven. But that was one item—not a trend.

David Fax, technical assistant to the vice president of engineering at Westinghouse, points out that mechanical engineers have been needed in the production of almost every piece of equipment from the projected nuclear powered rocket to improved electric motors and generators.

The Heat Is on Heat

One major problem in many new items, he says, is heat removal—a mechanical engineer's specialty. A generator's capacity, for instance, is limited by the temperatures it reaches. You can't just keep on putting in more and more mechanical power and producing more electricity. The heat generated becomes excessive, so you must find a way of producing less heat—or removing the heat. Armies of men will be required to lick this problem in plants throughout the country.

Kitchen ranges also are constantly under study to produce more compact ovens which will keep a uniform temperature without becoming too hot on the outside. Even such standard items as refrigerators are constantly under study to make them more compact and efficient.

Luke H. Noggle, manager of professional employment at Westinghouse, also notes that while his company continues to have an interest in people for purely analytical work, they are now looking only for people in this field with truly extraordinary talent. "Currently, we are more interested in men with an ability to solve customer-oriented problems. We need people who are willing to predict a probable payoff on the investment."

Deceptively, he said, while the largest graduating classes these days are in electrical engineering, the greatest demand is for mechanical engineers. "While of course we still require large numbers of electrical engineers, our need for mechanical men is greater now than in past years."

"Here at Westinghouse," he said, "we find our new people better trained technically than they were 10 years ago—but

(Please turn to page 48)

• MEN • Get a man's Job!!!

Earn up to \$200 per week in the Construction or Trucking Industries, on Jobs that Offer:

- SECURITY • TRAVEL • VARIETY • OUTSIDE WORK
- ### DRIVING



TRACTOR-TRAILERS

- MACCS • WHITES • GMC'S • KENWORTH
- INTERNATIONALS • PETERBILTS • DIAMOND T'S

"THE BIG DIESEL RIGS"

OR

OPERATING



- BULLDOZERS
- SCRAPERS
- GRADERS
- BACK HOES
- DRAG LINES
- CLAM SHELLS

HEAVY EQUIPMENT

Short practical training program will qualify you for one of the job openings in these rapidly expanding Industries. For complete information, Send Name, Address, Age, Phone Number, and Working Hours to:

ASSOCIATED HEAVY EQUIPMENT SCHOOLS, INC.
1141 NE 79th STREET, MIAMI, FLORIDA 33138

EARN BIG MONEY!

Learn APPLIANCE REPAIRING



Send for a FREE BOOK!

Learn at home in your spare time how to fix electrical appliances using Christy Electronic Trouble Tracer, how to wire homes and stores, rewind motors, how to get business, what to charge. Make \$5-6 per hour in your kitchen, or basement. Operate your own fix-it shop. Pay later from earnings.

CHRISTY TRADES SCHOOL

Dept. A-6803, 3214 W. Lawrence Ave., Chicago 60625

Excitement! Security! Good Pay! CRIME DETECTION

LEARN AT HOME IN SPARE TIME—START NOW!

Crime everywhere is on the rise! Learn now, in your own home, the profitable profession that enables you to track down criminals and bring them to justice! Hundreds of Identification Bureaus employ I. A. S. graduates . . . trained in fingerprinting, police photography, handwriting identification, firearms and investigation. Our 4th year! FREE "Blue Book of Crime" . . . packed with crime facts and the full story of famous I. A. S. training. State exact age. No salesman will call. Rush Coupon!

A Correspondence School Founded in 1914.

FREE
Blue Book
of Crime
MAIL
COUPON

INSTITUTE OF APPLIED SCIENCE, Dept. 1358
1920 Sunnydale Avenue, Chicago 40, Ill.
Rush Blue Book of Crime . . . FREE!

NAME Age
ADDRESS
TOWN STATE

EXCITING NEW WAY TO EARN UP TO \$15 AN HOUR INVESTIGATE ACCIDENTS



440,000 AUTO COLLISIONS, FIRES, STORMS EACH DAY CREATE A GREAT OPPORTUNITY FOR MEN 18 TO 60

CAR FURNISHED EXPENSES PAID

Needed Everywhere — City, Town and Farm

We CAN and WILL show you how to start your own profitable business. Begin part time—with your home as headquarters. Later expand to full time. Or if you prefer to be a Company Investigator—our Placement Bureau will give you REAL assistance. Over 500 leading firms—using tens of thousands of Accident Investigators and Claim Adjusters—have asked for Universal's monthly lists of recommended graduates. We train and place far more men in this booming Accident Investigation field than any other individual, company or school. Enjoy big pay, your own secretary, a car for personal use, and all business expenses paid.

— NOW! FREE BOOK GIVES YOU ALL THE FACTS —

UNIVERSAL SCHOOLS Dept. PM-11
6801 Hillcrest, Dallas 5, Texas

Rush me FREE Book on Amazing Opportunities In The Fast-Growing Accident Investigation Field. No obligation. No salesman will call.

Name

Address

City Zone State

LICKITY WACO LOG SPLITTER

Splits Big Profits from toughest woods—Ends Splitting Drudgery with 18 ton hydraulic power!



7 H.P. trailer unit squats under power to load logs without dead lift. Has 2 speeds, auto-shift, auto-stroke. 26" ram travel splits logs up to 34", any diameter—with extended frame and adjustable wedge splits up to 60". NEW LOW COST Economy model for farmers and small wood lots. Also ask about the 60L Series for logs up to 8½ ft. long—Details free.

Piqua Engineering Inc., Dept. P, Box 605, Piqua, Ohio

LEARN BY DOING— Work On Late Model Cars and Equipment . . .

Become a
Professional
**AUTO
MECHANIC**



Take the giant step into an assured future with expert knowledge of Auto Mechanics and a Lincoln Tech Diploma. *Not Home Study.* You learn by actually working with live engines, automatic transmissions, power steering and brake systems, etc. and the latest electronic test equipment. 80,000 well paying jobs are open right now for Trained Auto Mechanics, Ignition Tune-Up and Automatic Transmission Specialists. The Lincoln Tech graduate is in demand because *he knows his business!* He has the solid foundation for rapid advancement to foreman, shop manager, fleet superintendent, factory representative or owner of his own business.

FREE PLACEMENT SERVICE

Lincoln Technical Institute is recognized nationally for advanced teaching methods and personal guidance. Best of all . . . You can train in one of Lincoln Tech's resident schools located in principal cities throughout the United States.



New classes start every four weeks.
Get all the facts now!

LINCOLN TECHNICAL INSTITUTE

472 Market St. Newark, N. J. 07105

LINCOLN TECHNICAL INSTITUTE, SUITE 11-E
472 MARKET STREET, NEWARK, N. J. 07105

Please send me full information on the Lincoln
Tech Automotive School nearest my home.
I am interested in the course checked below:

- ☐ Automotive Mechanics
- ☐ Automatic Transmissions
- ☐ Ignition and Tune-Up

Name

Address

City State

CAREER BAROMETER cont'd

today an engineer must be able to look through his technical environment and see its relationship to the world around him. Mathematics, physics and chemistry are basic, all right, but an engineer should also be able to design a machine that specifies reliable components, and will be acceptable to the people who will use it."

A spokesman for the Army in Washington agreed that these conclusions were generally correct, but felt that the armed forces were not less interested in research and development today, despite the heavy demand evidenced for standard equipment of war.

Noggle also gave some sound advice for young people preparing for technical careers: "Do a lot of thinking about yourself on your own account, and decide on the things you *really enjoy doing*, because these are the things you will do best and most profitably in the years to come. Reach a conclusion about yourself, by yourself. Do not go into a field simply because you have heard people tell you you should. No matter how well-intentioned, advice from family and friends can often be quite misleading. You know yourself better than they do.

"Finally, consider the possibility of going to an engineering-oriented technical institute of any approved kind, rather than a standard college. Technical institute graduates are going to be in great demand, because the nation will need first-class technicians in all fields, and the pay is usually excellent."

Boom in Mechanical Engineering

As indicated by the chart on page 44, demand for mechanical engineers is heavy. One recent month shows 1,055 jobs open for such men with a wide variety of specialties. In one of these, piping, there is currently a very heavy demand, so that men who usually get \$4.50—\$5.50 an hour, are up to \$6.50 and \$7 an hour in some cases. These jobs are in steam-electric stations. The pipes involved are heavy-duty ducts of very large diameters, often carrying expandable materials under very high pressure.

Due to a growing shortage of carpenters in the Chicago area, currently enjoying a boom in homebuilding, the Carpenters District Council recently started a training program designed to produce more better-trained apprentices, and make the trade more attractive to young men. Many older carpenters have left the Chicago area for Florida and California where the weather is milder and does not interrupt work as often. ★★★

MAGIC MAIL PLAN

that comes with this Little Machine
CAN MAKE YOU \$5⁰⁰ AN HOUR



The machine is turning out a job that will bring operator \$2.50, by mail. Material cost, only 11c

Write today for free facts about the newest and most fascinating of all new home operated businesses. For the first time, a simplified machine brings the fabulous profits of Plastic Sealing and Plastic Laminating within reach of the small operator. Any one can learn to operate it with a few minutes practice. Then—with our MAGIC MAIL PLAN—can get mail orders pouring in daily with cash in every envelope.

No Canvassing or Selling

Fill orders at home in spare time to start. Then expand to full time business. We even supply circulars to bring back cash and orders. Rush name for all the facts you need to start. A postcard will do. No charge.

WARNER ELECTRIC CO., Dept. L-2-MW
1512 Jarvis, Chicago, Ill. 60626



Transistor Radio with Battery \$1.96

17-Jewel Watch \$2.87

Darringer Pistol \$5.74

HOME-IMPORT BUSINESS—Make Big Profits

New Drop Ship Plan offers you first day profits! Deal direct with overseas sources at prices shown. Dazzling bargains with no investment. Full or spare time. Write for FREE BOOK today to...

MELLINGER, 1554 S. Sepulveda, Dept. P25B, Los Angeles 25

NO JOB WORRIES

PLASTEX INDUSTRY needs manufacturers on small scale for big production of Lamps, Clock Stands, Art Goods, Novelties in Plastic Marble imitation. No experience necessary. Low material makes regular 10c store sellers. Moulds furnished for fast production. Small investment brings good profit. Big wholesale orders now being placed. Ambitious men have chance for real prosperity and job security. Our NEW FREE booklet will interest and benefit you.

PLASTEX INDUSTRIES, Dept. A
3400 Third Ave. New York 58, N. Y.

when it's time to think of college
you should read this
FREE CAREER BOOKLET
about engineering at

MSOE



MILWAUKEE MS-236
SCHOOL OF ENGINEERING
Dept. PM1165, 1025 N. Milwaukee Street
Milwaukee, Wisconsin 53201

Tell me about an engineering career through residence study in:

☐ Mechanical fields ☐ Electrical fields

Name.....Age.....

Address.....

City, State.....

Not everyone does as well,
but C. E. Nevin, who started a
business of his own, reports...



for 12 months
I've averaged
\$1000⁰⁰
per month



—most of it Clear Profit for Me!

• Mr. Nevin expressed his grateful thanks for the opportunity to have a fine business of his own. Many men have discovered how to be independent, to be freed of bosses and layoffs—to build their own future on a steady, dependable foundation. G. Mundt made more than \$400 one week. A father-son combination grossed \$33,000 first year. H. Lemon says, "I netted \$133 in one 8-hour day."

How much you make depends largely on you. You need no special skill, no large investment. Start part-time if you wish. We will help you get started and work with you for your success. Training and consulting with experts is available at no additional cost.

No shop necessary • Our **ELECTRIC RUG WASHER** cleans rugs and carpets like new right on the floor...removes dirt and grime and helps to show their natural color and beauty. So efficient and safe for carpets, it is used by largest hotels and railroads.

Don't delay. Mail coupon today for complete information including how to start making big profits in **YOUR OWN BUSINESS. BIG opportunity.**

Ours Is Not A Lease Arrangement • You are free to operate independently. You sign no contract. You own the detergent and are your own boss...every dollar you take in is yours. You pay no fees, or dues, or royalties, and enough supplies come with it to return far more than your investment. Many earn the cost of the detergent in a week or two. It costs nothing to get details...write **TODAY.**

Mail coupon today for interesting

↓ FREE BOOK

VON SCHRADER MFG. CO.
E10 "R" PL., Racine, Wisconsin

Send at once (no obligation) your **FREE** booklet containing information about your **ELECTRIC RUG WASHER** and how I can start my own permanent, profitable business.

Name.....

Address.....

City.....State.....Zip.....

VON SCHRADER MFG. CO.

Spotlight on the
**COMMUTER
CYCLE**

By Alex Markovich

With the smallest of the Hondas, you're king of the road—but beware of rain, road hogs, steep hills and hostile dogs

SMALL DOGS SOMEHOW LOOK BIGGER when there's no metal around you. Up steep hills, one dog-power is more than a match for small Honda's 4.5 hp

WIN!

the  ***Black & Decker®***

DREAM WORKSHOP

1150 FABULOUS PRIZES IN ALL

CUT ALONG DOTTED LINE

DREAM WORKSHOP SWEEPSTAKES ENTRY FORM

Name _____

Address _____

City _____ State _____ Zip Code _____

NOT VALID UNLESS SIGNED OR STAMPED BY DEALER

Dealer's Name _____

Dealer's City _____ State _____

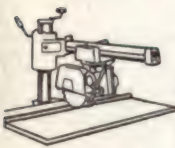
Mail Entry To: Dream Workshop Sweepstakes, P.O. Box 654, New York, N.Y. 10046

SEE OTHER SIDE FOR SWEEPSTAKES RULES AND PRIZES

WIN! *the* **Black & Decker®** DREAM WORKSHOP

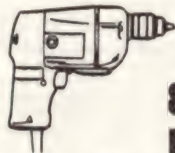
**GRAND
PRIZE!**

A real "Dream Workshop" designed by Popular Science Magazine and including a complete set of Black & Decker Power Tools, accessories, all the hand tools you'll need and a DeWalt R-1450 Deluxe Power Shop. Total value—more than \$2000!



**11 2nd
PRIZES**

New Model R-1150 DeWalt Home Shops. A dozen power tools in one, for any man's dream workshop.



**88 3rd
PRIZES**

New 1/4" Black & Decker Variable Speed drills. The trigger controls the speed. Most versatile drill made.



**300 4th
PRIZES**

Black & Decker Utility Jig Saws. The power tool that's seven saws in one. Perfect for every homeowner.



**750 5th
PRIZES**

Black & Decker Drill Accessory Assortments. Includes 22 pieces to fit any make or model electric drill.

CUT ALONG DOTTED LINE

SWEEPSTAKES RULES

1 No purchase required. Just complete this official entry blank. Hand print your name and address and take the entry blank to your Black & Decker dealer for validation.

Mail to: Dream Workshop Sweepstakes
P.O. Box 654, New York, N.Y. 10046

2 Additional free entry blanks available at participating Black & Decker dealers. Enter often as you wish, but mail each entry separately. Entries must be postmarked by January 15, 1966 and received by January 22, 1966.

3 Winners will be selected in drawings conducted by the D. L. Blair Corporation, an independent judging organization, whose decisions are final. Only one prize per family.

4 Sweepstakes open to anyone in the U.S. except employees of Black & Decker Mfg. Co., their families, their distributors, dealers and agencies.

5 Winners will be notified by mail. No substitutions will be made for any prize offered. This sweepstakes is subject to Federal, State and local regulations and is void where prohibited or restricted by law.

Expect the best from Black & Decker, Towson, Md. 21204



RAIN IS SOMETHING TO BE DREADED when two-wheeling. Forewarned by weather forecast, I brought along a folding raincoat, but my dignity was dampened. Leaning into corners is scary at first



SHIFTING IS A SNAP. Hit rear pedal (see finger) with heel and you're in first. Front pedal engages second and third. Rear pedal also controls downshifts. Black foot rest in middle is dead pedal

COMMUTING on a motorcycle is fraught with unforeseen hazards—as I found out when I borrowed a 50-cc Honda for five days.

I'd never ridden a 'cycle. And picking one up in midtown Manhattan, 23 congested miles from suburbia, didn't seem like the best way to learn. To give myself a fighting chance that fateful Monday, I arrived at Honda of New York before 3:00 p.m. to miss the evening rush.

The first thing I noticed on the little black-and-white Japanese machine was scores of pedals and levers jutting out at all angles. I decided to confess to the salesman that I'd need a little instruction.

Thankfully, several of the pedals turned out to be dead footrests. The twist-grip throttle control for the tiny 4.5-hp engine is in the right handlebar. A pedal operated by the right toe actuates the rear-wheel brake, and a caliper on the right handlebar applies the front-wheel brake. I was warned to apply the rear brake first and then the front, in quick succession—to avoid undesirable gymnastics.

The left foot operates the three-speed gearbox via two little pedals. Heel the back pedal and you're in first. Toe the front pedal twice and you're in second. Another tap puts you in third. The rear pedal is used in downshifting. The clutch is an automatic centrifugal unit.

Finally, there's a foldaway starter crank on the right. (We had the \$269 model; an electric starter costs \$30 more.)

End of training. I fired 'er up and started rolling out the door, but the salesman stopped me with the wag of an index finger. That engine, he decided, needed a carburetor and valve adjustment. By the time they let me out, it was well after 4:00 o'clock and traffic was building up.

Somehow I lurched, dribbled and hopped the few blocks to the parkway. Accident ahead. It was stop-and-go for several miles. Half the time I couldn't find the brake pedal, so I used my feet to stop.

Finally traffic cleared, and I could roar along at 35 mph, the bike's cruising speed. Meanwhile, everyone else zipped by at 50. The 50-cc model will do 45, but this speed isn't recommended for long.

I was almost starting to feel confident—until the road went right and I went straight, across two lanes. In the 15 years since I was on a bicycle, I had forgotten how to turn. Miraculously, no cars were near.

By the time I reached the first toll booth, my hands were aching from gripping the handlebars so tightly. I began searching for change when suddenly the bike

(Please turn to page 52)

FREE!



Trial lesson in DRAFTING & DESIGN

LEARN AT HOME IN SPARE TIME

Check the want ads in any newspaper—SEE the big-pay opportunities open to you as a draftsman. What's more, you can learn this well-paid, prestige profession at home—quickly, easily! No special talent needed! Get complete, step-by-step Chicago Tech lessons in the mail, spend a few pleasant hours studying each week. In a short time you'll be a well-trained draftsman, ready to take your pick of many good jobs. Act now!

FREE INFORMATION—MAIL COUPON TODAY!

Get FREE TRIAL LESSON plus information about C.T.C. practical training. Learn what successful Chicago Tech graduates say about high pay and opportunities in drafting. No charge, or obligation.

Est. 1904 Accredited National Home Study Council

CHICAGO TECHNICAL COLLEGE

P-203 Tech Bldg., 2000 So. Michigan Ave.
Chicago 16, Illinois

Mail me FREE Lesson with information about big opportunities in DRAFTING.

Name..... Age.....

Address.....

City..... Zone..... State.....

BIG EARNINGS WAITING



FREE Use of
Professional Tools
and Full-Sized
Typewriter
With Course



Learn to Repair, Rebuild,
Resell Typewriters, All
Makes—in your spare time!

NEVER BEFORE could you get industry-proved training at home! Now you can qualify quickly in your spare time for this big growth field. Thousands more trained men needed.

Earn while you learn with real typewriter, sub-assemblies, all professional tools, and step-by-step illustrated lessons prepared by industry experts for home study. FREE BOOKLET gives vital money making opportunities. Lic'd N.J. Dept. of Education. Act'd. Member National Home Study Council.

TYPEWRITER REPAIR SCHOOL
(Div. Technical Home Study Schools)
Dept. 310-115, Little Falls, New Jersey 07424
Send FREE BOOKLET describing unlimited opportunities for typewriter repairmen. No obligation.

Name.....

Address.....

City..... State..... Zip.....

MAIL
COUPON
NOW

Spotlight on the Honda

(Continued from page 31)

jumped. Omigosh, what did I do wrong now? Then I heard the driver of the car behind me apologize for clobbering me. I checked the rear fender; not even a nick. That Honda is built like a brick house.

The rest of my trip on the parkway was relatively uneventful, except for a dusty stretch under construction. I got enough dirt in my eyes to start a victory garden, so I made a mental note to buy goggles.

Just before home there's a steep hill. Even after a downshift, my speed dropped down to about 15 mph. All at once, there was a noisy blur of spotted white heading for the meaty part of my leg. That little neighborhood mutt was outrunning me! Only one thing to do. Bark back.

It was only after I reached my driveway that I realized how stiff my muscles felt.

Tuesday morning I got up extra early. The bike started easily from cold, but stalling was a problem. The solution was to ride away without warming up. Within a mile or so the stalling stopped.

I practiced at a nearby parking lot, and within minutes I was able to use body lean to steer pretty much where I wanted to go. But when shifting, I still had to think twice whether to heel or toe.

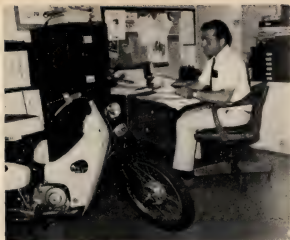
Dogs—All Kinds

Finally I started off to work. I still didn't trust myself in Manhattan traffic, so I rode to my in-laws' house in the Bronx, left the bike in their back yard and subways into Manhattan. The trip home that afternoon was uneventful except for a mild incline on the 50-mph-limit parkway, which caused my speed to drop to 20; there was much fist-waving from passing motorists. Oh yes, and I had another strained encounter with the dog.

By Wednesday I was starting to relax. Shifting, braking, steering, all had become fairly natural actions. I began to enjoy the scenery, to see the many things I had missed while driving a car. I felt a delightful freedom as the throaty *bra-a-ak* of the little high-revving engine filled the air around me. Once again I left the bike in my in-laws' back yard.

Before I left the office that afternoon, my wife phoned to tell me to bring home bread. Fine. I reached our local market without any problems and bought the bread. Then it hit me. No luggage rack. No basket. I had to hold the bag in my teeth. Luckily, the dog didn't chase me that day; I couldn't have barked back.

Thursday I got up enough courage to try for Manhattan. South of the Bronx, traffic really got constipated. Up to that



SOLVING THE PARKING PROBLEM is easy with a bike. Just bring it up into your office in the freight elevator—as long as you have an understanding boss. Fellow employees will want to try it out

point. I had stayed smack in the middle of the right-hand lane on parkways, but now cars kept squeezing into my lane. The only answer was to stay to the left of the lane and be ready to stop quickly.

I pulled into a garage near my office and asked the rate for a bike. "Three twenty-five," the attendant said.

"Why, that's what you charge for a car," I said indignantly.

"If it's got wheels, that's the price," he answered gruffly. "You can come in on roller skates and it'll still cost you \$3.25."

"Each?" I snapped, and roared out.

The next two garages didn't want any part of a motorcycle. "Don't have room for 'em," one attendant said.

Finally I found a garage that would take the bike for \$1 instead of the \$3 car rate.

On the way home it rained. A folding plastic raincoat didn't help much.

By Friday I felt like a pro as I weaved and darted through traffic. By the time I reached Manhattan, I got an idea: Instead of leaving the bike in a garage, why not bring it up into my office? The bike fit in the freight elevator perfectly. People stared and pointed, but no one stopped me.

Just after 9:00 A.M. the executive editor called me into his office on the double for a conference. You guessed what happened next. Did you ever hear an engine revving 9500 rpm down an office corridor?

It's now Friday afternoon. I just returned the Honda to the dealer, and I feel strangely let down. I know now that some day I must own a Honda—though I'd like a bigger model, with a little more speed than the 50-cc offers. I mentioned this to my wife and she said we can't afford one. But maybe if the kids could drink a little less milk every day and . . .

FREE

GIANT NEW CATALOG

100'S OF BIG PAGES CRAMMED WITH SAVINGS

BURSTEIN-APPLEBEE CO.

Dept. PM, 1012 McGee, Kansas City, Mo. 64106

☐ Rush me FREE 1966 B-A Catalog.

Name

Address

City

State

Please be sure to show your Zip No.

SEND FOR IT TODAY

FREE

START A MONEY-MAKING BUSINESS FOR LESS THAN \$50!



You can have your own lifetime business right at home . . . work in spare time . . . and make up to \$200 a month CASH! My FREE PLAN gives you all the facts: How to start, how to grow. You don't need previous experience. You don't have to sell. I'll even finance you. People bring you the work and pay cash. Over 90c of every dollar you collect is clear cash profit. And you work when you want to. Let me prove you can't find a more certain, lower cost, higher paying business of your own.

Just Mail Coupon—No Salesman Will Call

BELSAW SHARP-ALL CO., Stan Field, President
716E Field Bldg., Kansas City, Mo., 64111

Name

Address

City

State

FREE BOOK

Inventors peddle

THE WILDEST SHOW of the season whirled into New York City's Coliseum like a fresh March breeze recently. Pop-eyed spectators gaped at things such as smog filters that clip to people's noses; shrinkable films that form skintight gloves on human hands—or on anything; pot-side egg-timers that flip eggs from the water when done; a submarine that comes

out of the sea and flies like an airplane.

Gawkers watched moving belts that stole eggs from beneath frustrated hens. It dropped them, bobbling, through sorters and counters that tallied each grade size—and even put the finger on goof-off cacklers who weren't firing enough product into the line.

What brought all this on? A giant clam-



ROLL-OUT PLATFORM for station wagons slides the whole load back over the tailgate and simplifies loading and unloading. It was invented by Faliere Gelli to ease the problems of his catering service to offices, shops and factories



CHAIR CONVERTS TO A CRIB or youthbed for a youngster's overnight visits. Don Milne dreamed it up for grandparents living in small quarters, where a permanent crib would be in the way. He hopes that hotels will like it, too

their wares

By M. J. Pederson

bake known as the International Inventors and New Products Exhibition. It involved some 200 starry-eyed inventors and a similar number of visionary manufacturers—all combing the crowds for likely looking “angels” who might back their brainchildren. Several foreign countries and all 50 states were represented, according to our information from a spokesman for the In-

ternational Institute of Patented Products, Ltd., sponsors of the show.

Modeled after the annual Brussels Fair, the exhibition provided display space (at a basic rental fee of \$108 per booth) for new ideas from everywhere. A few “Rube Goldbergs” seemed bent on complicating life as much as possible. But most creations were designed to simplify matters. There was an automatic 15-day fish-feeder, and a typewriter margin indicator to eliminate the frustration of unwittingly typing to the bottom of the page. There was a novel method for playing the piano, too. The music score consisted of a visual reproduction of the keyboard, plus an intricate system of symbols and words (names of colors) to replace old-fashioned notes. To me—a dyed-in-the-wool note-reader—the system seemed impossibly cumbersome, at least for the uninitiated.

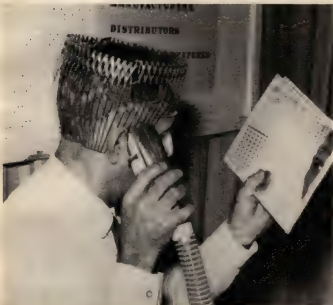
The most interesting aspect of the show, especially to non-trade visitors, was the inventors themselves. For the most part they were ordinary, sensible people who, recognizing a need for something, had solved the problem with a workable device and had seen their idea through to a patent. Here, in the American tradition, they hoped to capitalize on their brainstorms.

Most exhibits, consequently, represented frustrations turned into marketable products. A good example is Don Milne's crib which, when not in use as such, converts into a chair, coffee table or combination desk-bench. As grandparents of a little boy who made frequent overnight visits, the Milnes found it troublesome to be without a crib, but did not want one cluttering up the place when not in use. So their convertible crib was born. They hope it will become standard equipment in homes of retired folks, where space is at a premium, as well as in hotels and motels.

Another exhibitor who provided a convenience for others, by virtue of solving a problem of his own, is Faliero Gelli. He invented a highly practical roll-out platform for station wagons.

Gelli was a pilot in the Italian Air Force during World War II. Shot down by the British over Malta, he was shipped to England as a prisoner, then to the U.S. Upon release after the war, he made the United States his home and eventually set himself up in a unique catering business

(Please turn to page 56)



HAIR CUTTING GUIDE is used with brush attachment and vacuum cleaner hose which sucks hair out through ribs of crown-shaped guide. It insures an even haircut



DOWN-AT-THE-HEEL PREVENTER is a cleverly designed affair which, when worn in one place, can be given new life by rotating a section to an unworn spot

FREE!**NEW CATALOG
Big Savings...
FAMOUS MAKES!**

ACCORDIONS

**BUY DIRECT... at
Importer-to-You Prices
...save middlemen's profits!
5 DAY FREE TRIAL!****E-Z
TERMS
LOW DOWN
PAYMENT****Balance-Little as
\$872 a Month****Over 40
Standard and
Electronic
Accordions-
Amplifiers
for Students,
Teachers,
Professionals****SAVE UP TO 1/2
OFF RETAIL PRICES of
Comparable Accordions****TRADE-IN
Your Old
Accordion
BIG ALLOWANCE!**

WORLD'S LARGEST EXCLUSIVE ACCORDION DEALER saves you more than you ever hoped possible on new famous-make Italian Accordions of your dreams! Because you buy DIRECT... Importer-to-You... save up to 50% OFF retail prices of comparable accordions. Compare our low prices... see and judge for yourself. Rush coupon for FREE Color Catalog and low Importer-to-You price list. See America's most exciting selection... over 40 models. Exclusive features! Full range of Colors! Newest styling! Get FREE 5-DAY PLAYING TRIAL IN YOUR HOME. If you decide to keep instrument, pay for it only pennies a day on E-Z terms. 100% Satisfaction Assured. Get FREE BONUS GIFTS for promptness... Free Home Study Course. Trade-in allowance.

**FREE BONUS GIFTS
for promptness in ordering**

- Year's Supply of Music
- Home Study Course
- Sturdy Music Stand
- Name in Chrome Letter
- Bellows Protector
- Music Portfolio

Let us prove how much more you save—thanks to our money saving Importer-to-You plan. You pay NO Teacher's or Salesman's commissions. We buy for less, save on high overhead... and pass the savings on to you. Mail coupon today for FREE Color Catalogs and Importer-to-You prices. No obligation.

ACCORDION CORPORATION OF AMERICA
Dept. R-115, 5535 West Belmont Ave., Chicago 41, Illinois**FREE****Color Catalogs
...Low Direct
Importer-to-You
Prices... Rush
Coupon Now!****Accordion Corp. of America, Dept. R-115
5535 W. Belmont Ave., Chicago 41, Ill.**
Rush color catalog and "Importer-to-You" prices.

Name.....

Address.....

City & Zone..... State.....

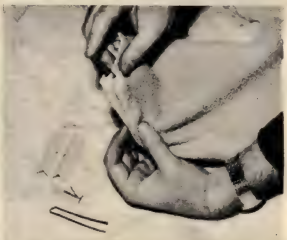
☐ Check if you have instrument to trade in.

Inventors peddle their wares

(Continued from page 55)



BARBERSHOP LUXURY may be had in the home with this hot lather dispenser that plugs into any outlet. Available soon at local drugstores and gift shops



PLEATED DRAPERIES require no sewing. They're made by folding fabric around sandpaper guide, then fastening pleat with a paper clip and lady's hairpin

in Irvington, N. Y. His "restaurant" was a station wagon, loaded up with an assortment of sandwiches, cakes and beverages. His customers worked in local offices, shops and factories. His annoyance, each time he loaded or unloaded his wares, or spilled hot coffee while trying to reach the innermost items, supplied the motivation for his roll-out platform—a false bottom that slides out over the tailgate and brings everything on it within easy reach. It's a "natural" for station wagon vacationers.

The youngest occupant of a booth, following in his father's footsteps, was six-year-old Andrew Sobel. He's the inventor of a telescoping fishing rod that is small enough to fit into a briefcase or schoolbag. It should be just the thing for hooky-



FILTER OF BLOTTER TYPE PAPER and cotton fibres inserted in cigarette shows tar and nicotine stain left after smoking. Liquid absorbent paper is key

players, including traveling salesmen who like to fish on the boss's time.

Andy's father, an emigrant from Poland and holder of several U.S. patents, was not to be outdone by his progeny. He has a few ideas of his own available for licensing; one is a method enabling a man to wear his trousers with or without cuffs, depending on his whim or the occasion.

For people who want to make pleated draperies, but can't sew and don't want to learn, there is now a way out. They need only fold the fabric around a sandpaper guide, and then fasten the pleat with a paper clip and a lady's hairpin. **That's all it takes.** Abe Levine of Brooklyn, N. Y., is the inventor.

In a lighter vein, the Stephen Barratt Co. has created a frightening golf ball that should awaken the sleepest early-morning foursome. They'll see a trail of colored smoke stream from the ball as it soars down the fairway. Chemicals stored inside the ball are released through small holes when it is driven from the tee.

As the hectic five-day show drew to a close, it was evident from some jubilant expressions that many a dream might be on the verge of realization. Others, dejected by the activity in neighboring booths, appeared resigned to packing up—mission unaccomplished, this time. Regardless of the outcome, most exhibitors will turn their thoughts to "next time" and the promise of the sign on the Coliseum marquee which reads: "One idea can change your future."



SECOND-GRADER Andy Sobel extends telescoping fishing rod he invented. It fits in a case the size of a pingpong paddle

You're Never Out of a Job With a Sparetime

BUSINESS OF YOUR OWN



Turn your spare hours into extra dollars this proven, practical way—start your own money-making sharpening business! No selling or canvassing, no experience needed... you do it all automatically with the Foley Saw Filer or Mower Sharpener.

Earn \$3⁰⁰ to \$6⁰⁰ an Hour in Sparetime



Hundreds of people like yourself are making cash like this—\$20 to \$30 a week—right now in spare time. "My spare time saw filing business has made me \$952 these first ten months"—says R. T. Chapman. Many have built a complete sharpening service with year-around profits. You can, too, simply by following, the sure, easy Foley plan.

No Experience or Training Needed

You can sharpen combination (rip and crosscut) circular saws, hand saws, band saws, crosscut circular saws—and do a perfect job every time without experience or special training! The precision Foley Filer does it for you automatically! A complete repair shop in one machine! Set up in basement or garage, work your own hours in your own way and earn big sparetime profits.



Husband and Wife Have Going Business

Here's the story from Dick and Jo Ann Koester after being in business 10 months: "We have acquired another Foley Saw Filer and for the past two months we have been in full-time operation. As we live in a small town of 150 population in farm area we use our truck to pick up saws in five nearby towns. With a family to support and plans for building to our house we had to pick up business fast and already sharpen an average of 15-20 saws a day. Business for the future looks even better as good machine filing is our best advertising."



Free Booklet Tells How

Free Book "Money Making Facts" shows just how you can start at home in spare time and sharpen hand, band and circular saws with the Foley Saw Filer. Small investment—time payments if desired. Get this booklet—study it! Send coupon today. No salesman will call on you.

**FOLEY MFG. CO., 1116-5 Foley Bldg.
Minneapolis, Minn. 55418**

Send free book "Money Making Facts" and Time Payment Plan

Name

Address

City State Zip Code

DETROIT **LISTENING POST** BY JIM DUNNE

Here comes the front-drive Merc

Mercury has been selected by the Ford Motor Co. as its front-wheel-drive car. A front-drive system, now in test cars, will be made available through the Mercury line two years from now. The front-drive system will be standard equipment, available on station wagons as well as sedans and convertibles. This is the first firm reaction by a competitor to Olds' front-drive Toronado.

Olds is also prepared to make its front drive available on the rest of its car lines. An Olds official told us over a year ago that the system would spread to other Olds models if it was successful in the Toronado.

What's new in engines

GM car divisions have been forbidden by the front office to put any engine bigger than 400 cu. in. into small cars. One exception is the Corvette, considered a special case. The rule has led to some strange engine shuffling in the divisions. Chevrolet can use the 396 cu. in. engine in its Chevelle but not the 427, even though both are nearly identical in every other respect. Buick's 401 cu. in. power-plant suddenly became a 400 cu. in. size when used in the Skylark. Same engine, different accessories. Oldsmobile performed a minimum of changes on its standard 425 cu. in. engine to drop displacement to 400; offers it as a top power option on the F-85.

Chrysler Turbine engineers no longer expect a dramatic breakthrough in turbine engine development. So they have been busy just refining the present turbine design. Right now the turbine can match a modern gas V8 in both performance and fuel economy. Major roadblocks to its mass production are the high cost of turbine wheel materials and the huge investment necessary to build up a service system.

Mustang will get a major facelift next year. The sporty Ford will receive more styling attention when the 66s come out because of the expected competition from Chevrolet's new small car (Panther?). The fastback Mustang will have a racing car look. Its roofline will extend clear back to the rear bumper, and the rear end will have the bobtailed styling of Ford's GT race car. New sheet metal and a new grille design will be used to freshen up the front end appearance.

Chrysler goes sporty; Mustang sportier

Ford's success with the Mustang will prompt Chrysler to bring out a similar car within the next two years. Chrysler officials say privately that the company will have a new car in the line-up soon. Right now Plymouth's Barracuda is not enough competition for the Mustang, and company officials say a complete new line of cars is the only answer.

Modern sex appeal for the Rolls

Rolls Royce is en route with a completely new car. It will be lower, wider, sport a modern appearance. It should be out within a year. It will compete with American styling for the first time. Price remains about \$20,000.

Shift to automatics

Are 4-speed transmissions overrated for performance driving? "Yes," say some Detroit engineers. Automatics have proved conclusively faster on the drag strip, and now they are being used in road races with some success. Pontiac engineers say they have a number of automatic transmissions on the shelf that will outperform a 4-speed almost every time. The Chrysler Corp., thanks to its automatics, has revolutionized stock car drag racing, cutting short the revival of 4-speeds in that competition. Still, the 4-speed box, with its high price tag, continues to be a big seller. All indications are that sales of 4-speed boxes will increase

(Please turn to page 60)



"JOHN F. KENNEDY" 1964-P MINT SETS

NOW... A GREATER GIFT THAN EVER—Unconditionally Guaranteed



The silver coins we have known will no longer be minted... the silver in the Kennedy half dollar reduced to 40%, no silver at all in quarters and dimes. We still have brilliant, uncirculated 1964 Sets, in sparkling plastic holders.

BIG STATE COIN CO. (Dept. B-8) • 1416 Commerce St. • Dallas 1, Texas

295 10 SETS
27.50
postpaid

Please send me _____ '64-P mint sets

NAME _____

STREET _____

CITY _____

STATE _____

☐ CHECK ☐ M.O. ☐ C.O.D.

B.S. DEGREE IN 36 MONTHS

Small professionally-oriented college. Four-quarter year permits completion of degree in **Engineering or Business Administration** in three years. One year **Drafting and Design Certificate** program. Founded 1881. Rich heritage. Excellent faculty. Small classes. Well-equipped labs. No library. Residence halls. 300-acre campus. Graduate placement outstanding. Modest costs. Enter Jan., March, June, Sept. For Catalog And View Book, write Director of Admissions.



TRI-STATE COLLEGE

4115 College Avenue • Angola, Indiana

PROFIT IN YOUR SPARE TIME



SMALL ENGINE REPAIR PAYS BIG!

Outboard • Powermower • Chain Saw • Tractor
MAKE EXTRA MONEY — or fix your own engines and **SAVE!** Illustrated, easy-to-learn Home Study Course qualifies you as expert. Free information. Write today!

LINCOLN TECHNICAL INSTITUTE
SUITE 11E, 472 MARKET STREET, NEWARK 5, N.J.



Earn **HIGH WAGES** as a
HEAVY EQUIPMENT OPERATOR



... and years of future security in the multi-billion dollar construction industry, in this country and overseas! Learn how at National, the original school of heavy equipment operation. For men ages 17 to 36. National is NOT a correspondence school. You train on school-owned diesel-engined machines at National's huge proving ground in North Carolina. Full 220 and 440 hour courses. Full-time Job Advisory and Counseling Director for the exclusive benefit of graduates. VA approved. Payment plans available. Write TODAY for FREE catalog. National School is a Member of American Builders Association Service and Supply Division.

Since National School was founded ten years ago, students from all 50 states and 28 foreign countries have been enrolled. Hundreds of graduates are now working in construction for higher wages than they ever made before.

NATIONAL SCHOOL
OF HEAVY EQUIPMENT OPERATION Dept. D-69
P. O. Drawer 1686, Charlotte, N. C.

Please send me **FREE** illustrated school catalog and complete payment information. I understand there's no obligation.

Name..... Age.....

Address.....

City..... Zone..... State.....

PLANER • MOLDER • SAW!



Now you can use this **ONE power-feed** shop to turn rough lumber into moldings, trim, flooring, furniture... ALL popular patterns. **RIP... PLANE... MOLD...** separately or all at once with a one HP motor. Use 3 to 5 HP for high speed output. Low Cost... You can own this power tool for only **\$30.00** down payment.

Send postcard today for complete facts.

BELSAW POWER TOOLS, 906 Field Bldg., Kansas City 11, Missouri

Build Your Own Business While Still Employed

It's true Without quitting your job... without losing one pay check... you now have an opportunity to double your income in your own business. Free 24-page book tells how other men do it... then grow to a full-time high income business.

Gross hourly profit \$9.00... PLUS \$6.00 additional on each serviceman. Income is unlimited.

Your on-location service is Nationally Advertised, worldwide, and endorsed by McCall's and Parents' magazines... and by carpet mills and furniture makers. It's easily demonstrated... easily sold.

Exclusive **absorption** process cleans and **revives** upholstery and carpets. Customers watch color tones come back...reenlivened pile rise... textures regain new look. They appreciate the careful craftsmanship with **no machine scrub**.

Your craftsmen become your best salesmen.

You have 5 other equally superior services. No experience needed. We train you... guide you **step by step** and finance you for all but a few hundred dollars. Easy to learn... easy to do... easy to build a steady growing volume. We show you 15 tested ways to get customers.

G. F. Monroe, after 12 months, sold his business for 10 times his cost. Leo Lubel sold his for \$7,116 more than he paid. L. Babbitt writes, "I average \$2,600 monthly part time." W. C. Smith earned \$650 in one week. Ed Kramsky said, "In two years I have two assistants, a home and security."

This may be the opportunity of your life. **Find out today** before someone else gets your location. Mail coupon now for details and 24 page illustrated free book. No obligation. No salesmen will call. Mail coupon now while territories are open.

-DURACLEAN COMPANY-

5-16N DURACLEAN BUILDING, DEERFIELD, ILL. 60015

Send 24 page illustrated book that explains how to double my income in spare time with my own business. Everything you send is free. I am under no obligation. No salesman will call.

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____



EARN \$1,000 A MONTH

LEARN A TRADE YOU LIKE

Start as a mechanic in a good paying job; then advance to shop service manager. Many make \$1,000 a month and up. You learn fast in our shop because you learn with tools on real equipment. Some students earn part of their expenses while going to school.

CHECK AND MAIL COUPON

- | | |
|---|---|
| ☐ AUTO MECHANICS | ☐ AUTO BODY REPAIR |
| ☐ DIESEL MECHANICS | ☐ AUTOMATIC |
| ☐ GAS, ARC WELDING | ☐ TRANSMISSIONS |
| ☐ HELIARC WELDING | ☐ MOTOR TUNE-UP |

Mail to: **AUTO-DIESEL COLLEGE**
226 7th Ave., No., Dept. 86, Nashville, Tenn.

Please send without obligation free catalog

NAME _____
(please print or write plainly)

ADDRESS _____

CITY _____ STATE _____

GET INTO ELECTRONICS

F.T.I. training leads to success as technicians, field engineers, specialists in communications, guided missiles, computers, radar, automation, Basic & advanced courses. Electronic Engineering Technology and Electronic Technology curricula both available. Assoc. degree in 29 mos. B.S. obtainable. G.I. approved. Start Feb., Sept. Dorns, campus. H.S., graduate or equivalent. Catalog.

VALPARAISO TECHNICAL INSTITUTE
DEPARTMENT D, VALPARAISO, INDIANA



PLAY GUITAR IN 7 DAYS OR MONEY BACK



TOP GUITARIST ED SALE's famous 66 page secret system worth \$3.00 teaches you to play a beautiful song the first day and any song by ear or note in seven days! Contains 52 photos, 87 finger placing charts, etc. plus 110 popular and western songs. (words and music); a \$1.00 Chord Finder of all the chords used in popular music; and a \$3.00 Guitarist Book of Knowledge.

TOTAL VALUE \$7.00
—ALL FOR ONLY **\$2.98**

SEND NO MONEY! Just your name and address, pay postman: \$2.98 plus C.O.D. postage. Or send \$3.00 with order and 1 pay postage. (Sorry, no C.O.D. outside Continental U.S.A.—please remit with order).

Unconditional Money-Back Guarantee

ED SALE, Studio 153-R AVON BY THE SEA, N. J.

LISTENING POST continued

over the present 400,000 annual rate. How about you? Do you have a special reason for liking the 4-speed? France's Renault car company has a good sales gimmick. Renault sent out 33 panel trucks equipped with light repair parts and tools to aid stranded motorists. The trucks cruised French highways during this past summer and fall. It started as an advertising stunt, and proved so successful that other auto makers on the continent are reported ready to try the same thing next summer. The trucks will service any motorist free of charge as long as the trouble can be cleared up within 15 minutes. Problems with fuel, oil, water, tires, fan belt, or similar small items were worked on regardless of make.

STP Specials for Indy

Carroll Shelby, the Cobra builder, may be in next year's 500-mile race at Indianapolis. Shelby reportedly has been lining up a car with European-made chassis and Ford power. Jim Hall, Shelby's opposite number with Chevrolet, is also reported interested in the race. Look for the STP Specials, the only 4-wheel drive design of recent years, to be back in Indianapolis next May. And don't count out the Offenhauser engine yet. The Drake half of the Meyer-Drake partnership that sells the Offy is developing a lighter, more powerful engine to stay competitive with the Fords.

Cars are getting cooler

Car airconditioning, once considered a rare luxury, continues to boom in popularity. Lincoln is selling over 90 percent of its cars with the cool option, the first time any car has exceeded that figure. More than 78 percent of Lincoln convertibles are delivered with A/C! Cadillac, with the most simplified controls, installs its Comfort Control system on 83 percent of its cars. Even Rambler, with the so-called "economy car image" delivers more than one of every ten of its cars with airconditioning. In two years all makers will have one temperature control lever like Cadillac's, making the option even more enticing.

Turn with a twist is in

Mercury will produce more cars with its "wrist-twist" steering system this year, but they will be used for test purposes only. (Wrist-twist replaces the steering wheel with two small steering rings mounted on the ends of a crossbar fitted to the top of the steering column.) The newer wrist-twist units will have variable ratio systems. Wrist-twist is not ready for mass production this year, according to Mercury. Confidentially, though, you'll be able to buy the system later in 1966. Cost will be about \$100 more than power steering. . . . Ford's overhead-cam engine is not generally available to the public, despite what Ford says. You have to be in the race business to get one. But the company may be forced to loosen up its sales of this engine to keep up with the strong competition from Chrysler's Hemi and Chevy's new 427.

World's Only PRE-SMOKED PIPES!

Dr. Grabow

WORLD'S FINEST IMPORTED BRIAR

Starfire . . . \$4.95 Commodore \$7.95
Viscount . . . \$5.95 Eldorado . . \$10.00

NEED NO BREAKING-IN

Your favorite blend never had it so smooth, right from the very first puff because: the world's only pre-smoked pipe needs no breaking-in! What curing does for tobacco, pre-smoking does for your Dr. Grabow.

For FREE Information Booklet, Write Dept. PM, DR. GRABOW Pre-Smoked Pipes, Greensboro, N.C.

LAW FREE BOOK

THE LAW
TRAINED
MAN

Write today for a FREE copy of illustrated law book, "THE LAW-TRAINED MAN," which shows how to earn the professional Bachelor of Laws (LL.B.) degree through home study of the famous Blackstone Law Course. All necessary books and lessons provided. Moderate cost; convenient monthly terms. Write for FREE law training book today.

Blackstone School of Law, 307 N. Michigan Ave.
Founded 1890 Dept. 58, Chicago 1, Illinois

At Last a New Amazingly Simple

GAS TURBINE JET ENGINE

Build from easy to follow plans. Length 15",
Dia. 8 1/2", Wt. 15 lbs. Fuel: Gasoline or Kero.

"Screamin' Demon" develops 20 H.P. Ideal project for serious-minded hobbyists, students; scientific and industrial arts classes. Make on 9" metal cutting lathe with milling attachment. For use on small racing boats, model cars, etc. Full size assembly drawings with critical dimensions, bill of materials and photos. Price \$5.00. No C.O.D.
SAVOY SCIENTIFIC, BOX 1398, SANTA MONICA, CALIFORNIA



By RAPHAEL SOYER

STUDY

ART

In Spare Time

Do you like to doodle or sketch? Try famous WSA's new home-study Course in Art. In spare time learn drawing, painting, advertising art, illustrating, cartooning, fashion, TV art—only \$6 a month! Get TWO big art outfits (\$25 value) without extra charge! Send name and address for FREE BOOK. No obligation; no salesman. WASHINGTON SCHOOL OF ART, Studio 1411, Port Washington, New York 11050. Estab. 1914; Accredited Member, National Home Study Council. Tear out ad as a reminder.

"I Have My Own Shop Now!"

Says FREEMAN J. JEFFRESS, Oklahoma City, Okla.

"Your locksmithing course is so good, I wouldn't take back the money I paid for it. I have a nice little shop set up in my home and it has already paid for itself!"



Be a LOCKSMITH

Train at HOME—Earn While You Learn. Add 50%-100% to YOUR INCOME with easy spare time earnings. Cash in on the nation-wide shortage-trained locksmiths in great demand! Quickly step into a big pay opportunity job or start a high-profit shop of your own.

Earn Extra Money RIGHT AWAY! All Master Locksmiths Special Tools, Equipment and Supplies furnished for use with course.

Age, education, minor physical handicaps don't matter in this growing trade. You can quickly qualify as a skilled locksmith. It's like a fascinating hobby. Study at home as little as one hour a week. Gain practical experience through complete well-illustrated lessons. Do real jobs on car locks, house locks, padlocks and safe locks, under the guidance of experts. FREE Illustrated Book, write now.

LOCKSMITHING INSTITUTE,
(Div. Technical Home Study Schools)

Dept. 110-115, Little Falls, New Jersey 07424

306

pieces of professional equipment

Supplied
for use with course.

MAIL
COUPON
for FREE
ILLUSTRATED
BOOK

For a future as your own boss or in a high-pay job, write now for FREE Illustrated Book. Only school of its kind: Licensed by State of New Jersey; Approved for Veterans.

Professional Equipment
includes
LOCKS—PICKS—PARTS—KEYS
SPECIAL TOOLS & SUPPLIES

Est. 1948

Acc'd Member Nat'l Home Study Council.

MAIL COUPON NOW

LOCKSMITHING INSTITUTE, Dept. 110-115
Little Falls, New Jersey 07424

Please send FREE Illustrated Book—"Your Big Opportunities in Locksmithing," complete Equipment folder and sample lesson pages—FREE of all obligation—(no salesman will call).

Name..... (Please Print)

Address.....

City..... State..... Zip.....



POPULAR MECHANICS SHOPPING GUIDE



FREE "NOTE-FINDER"

Guides Your Fingers to Right Key For Every Note—Play Real Tunes Your Very First Day



LEARN PIANO! (Or Guitar, Accordion, Sax—Choice of 16 Instruments.) Mail ad today! We'll send you famous U.S. School of Music PIANO "Note-Finder" absolutely FREE. Then you can prove to yourself how you can play real music—properly, by note—even if you don't know a single note now.

Stop Denying Yourself These Joys!

Music can bring you new friends. Gay parties. Good times. A career. Extra Money. Help you relax, banish worries and frustrations. Satisfy your desire for self-expression, creative urge. Gain self-confidence!

SEND FOR FREE "NOTE-FINDER" AND BOOK. Illustrated book describes fascinating story of wonderful proven Course that has you playing delightful pieces right away—from your very first lesson.

Simple as A-B-C. Learn at home, only few cents a lesson. For FREE "Note-Finder" and Book, mail ad today to U.S. School of Music, Studio A3011, Port Washington, N.Y. 11050. Est. 1898—Lic. by N.Y. State Education Dept.

FREE BOOK

Name (Please print)

Address

City & State Zip Code

CUTS TOUGH TOE NAILS TOO



HOW TO REMOVE INGROWN NAILS

A GIFT EVERYONE NEEDS

Now you can remove ingrown nails, and trim those hard to cut toe nails the safe, easy way. Narrow, straight, pointed blades allow you to reach in and under to safely remove painful ingrown nails. Powerful, plier-type nippers cut even the toughest toe nails with ease. Nails are cut straight across as recommended by foot specialists. Made from the finest surgical steel for a lifetime of service. Don't suffer another day with painful ingrown nails or annoying hard toe nails. Send for this professional nipper now: 5" long, NOT SOLD IN STORES! POSITIVELY GUARANTEED TO DO THE JOB OR YOUR MONEY BACK! Try it for 30 days. If you don't agree it does the job better than any scissors, clipper, or whatever you are using, return it for an immediate refund. \$5.95 ppd. or 2 for \$11.00 ppd. from ARLENE'S, Dept. PM-115, 4075 Polk Street, Riverside, Calif. 92505.

save money on CARS & TRUCKS

LEARN HOW YOU CAN SAVE HUNDREDS OF DOLLARS THRU WHOLESALE TRADING POST!

FREE



at no obligation whatever, we'll send you full details of how you can buy any make or model car or truck, how easy financing & delivery to your door can be arranged, how you can actually save hundreds of dollars on exactly the same car you'd buy elsewhere.

NAME

STREET

CITY STATE

Mail coupon now! Write: Dept. B-50

WHOLESALE TRADING POST

Great Neck, New York 11021

Build anything from fiberglass? Yup, anything. See "Ply-foam: New Workshop Wonder," page 146.

Investigate Before You INVEST

SINCE 1920

BARBEE

RADIATOR

EQUIPMENT SUPPLIES

SCHOOLING

Free Catalog On Request

A radiator service business can be a profitable one! If you are thinking of a business of your own or adding a department write Barbree for details. No investment of \$1500 to \$3000 will pay greater dividends. Two weeks free schooling masters fundamentals. Small down payment starts you. Our easy pay plan lets you pay from profits.



The BARBEE Co.,
P. O. Box 323PM,
Louisville, Ky.



THOUSANDS OF EXCITING TOOL VALUES!

Stanley, Millers Falls, Skil, Diaston, Wiss, Dremel, Speedy

Sprayers, Plumb, Porter, Channellock, Bonney, Herbrand, Helios, Kennedy Boxes, Huot, Vise Grip, Ridgid and many other Nationally Advertised brands of Tools & Supplies too numerous to mention. We Ship Coast To Coast At Prices Hard To Beat Send 25c today for our Big 148-page Tool Catalog.

SILVO HARDWARE CO.
Dept. PMD, 107 Walnut St.
Phila., Pa. 19106

Add to your income

Much as
\$6 AN HOUR SHARPENING

Make money, spare or full time, whether employed or not. Own your own business sharpening knives, cutlery, saws, tools. **100% CASH!** TREYCO Sharpeners making money for thousands.



Low factory-to-you tells you how, prices, no salesmen. Write...

FREE BOOK *How to Sharpen*

TREYCO PRODUCTS
381 TONAWANDA STREET
N. TONAWANDA, N.Y.

NEW! SCR CAPACITIVE DISCHARGE FURY XII ELECTRONIC AUTO IGNITION SYSTEM



MK
MICRO-KITS INC.

- All Components Pre-tested
- 8 Amp Silicon Control Rectifier
- All Motorola Semiconductors
- Mylar Capacitors Throughout
- 2 Microfarad Storage Capacitors

Designed for quality—engineered for reliability! 5 1/4" x 1 3/4" x 3 3/4" ALL-DIODE TRIGGERING for proven reliability. All advantages of capacitive discharge PLUS solid state electronics! Provides SUPERIOR COLD STARTING ability! Install in 10 minutes! In KIT form or FULLY ASSEMBLED. ORDER TODAY AND SAVE BIG MONEY!

FURY XII DLX. KIT SHOWN \$39.95
FURY XII DLX. MODEL—ASSEMBLED 66.95
MK Standard Model Kit 29.95
MK Standard Model Assembled 49.95

MICRO-KITS CO. DEPT. PM 1165P.O. BOX 405,
15547 So. Garfield Ave., Paramount, Calif. 90723

- ☐ 1 ENCL. \$39.95 for FURY XII DELUXE KIT
- ☐ 1 ENCL. \$66.95 for ASSEMBLED FURY XII
- ☐ 1 ENCL. \$29.95 for MK STANDARD KIT
- ☐ 1 ENCL. \$49.95 for ASSEMBLED MK SYSTEM
- ☐ PLEASE send FREE LITERATURE

NAME

ADDRESS

CITY STATE

\$150 GROSS IN SINGLE MONTH IN MY OWN BUSINESS

F. E. DORAN reports

Some make more, some less...

START YOUR OWN BUSINESS NOW! • Here's YOUR chance to start a money-making, year 'round business of your own and make the success you've dreamed about.

G. R. Adcock took in \$102 in one day. O. W. Hare landed a \$750 hotel job. J. S. Corbit grossed \$279.50 his first month. Homes, hotels, offices, clubs, offer you big profit possibilities. Auto upholstery also.

NO SHOP NECESSARY • You clean upholstered furniture with efficient **PORTABLE ELECTRIC DETERGER** on customer's premises. No hauling, no high rents; you operate from your home. Supplies cost little; what you take in is mostly profit. Training and consulting with experts is available at no additional cost.

Ours is NOT a Lease Arrangement • You are free to operate in an independent manner. You sign no contract. You own the detergent outright and are always your own boss...and every dollar you take in is yours to keep...you pay no fees, or dues, or royalties to anyone, and enough supplies come with it to return far more than your investment. Many earn the cost of the detergent in a week or two.

It costs nothing to get the details...write TODAY!



MAIL COUPON TODAY FOR FREE BOOK

VON SCHRADER MFG. CO.
E10 "D" Pl., Racine, Wisconsin

Without obligation rush your **FREE** booklet about how I can start my own permanent, profitable electric Upholstery Cleaning business.

Name _____

Address _____

City _____

State _____

Zip _____

CAST A TOY ARMY



POUR and PAINT

lead soldiers 2 1/4" tall
in 3 action poses...
up to 100 per hour...
For FUN & PROFIT!

JUST LIKE DAD DID, ONLY BETTER! EXCITING KIT

Includes 3-solder mold, clamp, handles. Electric stove, indle. Only 10.00
Paints, brush, 16 pigs of casting metal. A world of fun. postpaid
Add \$2 W. of Rockies, Canada, Mexico

Fascinating WOODBURNING KIT

makes decorative gift items. Includes tie rack, coasters, hot plates, plaques, U/L approved Burn-Rite air cooled burning pen, coloring palette, brush, dishes: pattern transfer, sandpaper, color leaf foils. For hours of profitable fun, only \$3.00
Add 75c for postage.
Satisfaction guaranteed



AIR LIFT AIR SPRINGS



HANDLE ANY OVERLOAD

✓ The only air-adjustable overload spring — fits any car or light truck.

✓ A safe, level ride for vacationers, sportsmen, businessmen, trailers.

✓ Quickly installed — no parts removed from car.



FREE literature: Dept. PM
OVER 1,000,000 SETS IN USE

AIR LIFT AIR LIFT COMPANY
Lansing, Michigan



U. S. Pat. Pend.

Swedish Inventor Discovers A New Way To Trim Hair At Home In Minutes

Automatic **DIAGONAL** 4-way cutting action trims your hair an entirely different way. Smooth, expert trim of any desired length & style are assured. New principle makes old style straight trimmers obsolete. Quick, Easy, 100% safe. **TRIMTEX REALLY WORKS. PERFECT FOR MEN, WOMEN & CHILDREN.** Try it for 30 days. Save on hair cuts during trial. Money back if not 100% pleased. Only \$1.98, 2-\$3.75 ppd. **FREE** Travel Case included. **DIBBEN CO.**, Dept. 10-N, 545 Fifth Ave., NY 10017.

Money Back Guarantee

HEAVY DUTY-ARC WELDER

Five Year Guarantee

The New 1986 Model Heavy Duty 110 Volt Arc Welder works on any 110 volt house line. You can not buy a better welder anywhere at this low price. No experience necessary. Now anyone can braze, solder, cut and weld any metal up to 1/2". Generates heat up to 10,000 degrees for cutting through steel plate, etc. **NOTHING ELSE TO BUY.** Comes complete with 12 ft. of heavy duty power cable, 1/16" and 1/8" welding and brazing rods, rod holder, twin carbon torch, helmet, instruction book, etc. **MONEY BACK GUARANTEE.** Try it for 10 days. If you are not completely satisfied we will immediately refund your money without question. —FULLY GUARANTEED FOR FIVE YEARS. If inoperative, we will repair or replace it free of charge. **SEND ONLY \$2.00.** and when delivered, pay postman \$12.95 plus (.00 postage, or send \$14.95 and we will ship postpaid. Over 10,000 National Electric Welders are in use throughout the world. (For an extra large supply of rods, carbons and flux, send an additional \$2.00.)



ONLY \$14.95

Order Direct from factory: **NATIONAL ELECTRIC**, Dept. PM-11, DELRAY, FLORIDA

ELECTRONICS

COYNE ELECTRONICS INSTITUTE

A quarter million dollars worth of equipment. Non-Profit Institute—Est. 1899. Courses: Electronics • Electricity • TV-Radio • F.C.C. • Electronics Engineering Technology. Mail coupon or write for FREE BOOK, "Your Opportunities in Electronics." No Salesman will call.

COYNE ELECTRONICS INSTITUTE Educ. Serv. Dept. 85-S

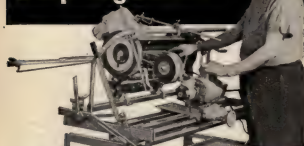
1501 W. Congress Parkway, Chicago, Ill. 60607

NAME _____ PHONE _____

ADDRESS _____ AGE _____

CITY _____ STATE _____

Here's How You Can Have a Profitable Lawn Mower Sharpening Business



EARN \$5 AN HOUR!

Earn extra cash right from the start—average \$5 an hour. The Foley Lawn Mower Sharpener is a complete shop in one machine. No experience is needed to start—although you can operate it, and turn out professional-like jobs. All operations are done quickly, easily and accurately.

Operate in Sparetime, in Your Own Home
An ideal sparetime business—although many find it so profitable, they devote full time to it. For complete fact-filled booklet, send coupon. No salesman will call:

Foley Mfg. Co. 1107-5 Foley Bldg., Mpls., Minn. 55418

Send booklet on Lawn Mower Sharpening business.

Name _____

Address _____

City _____ State _____ Zip Code _____



"\$705⁸³ LAST MONTH SERVICING RADIATORS"

—BOSS FLUMMERFELT
HUGOTON, KANSAS (Pop. 2,012)
Operate your own profitable business. Easy to test, clean, repair auto-truck-tractor radiators with Inland equipment. Inland, world's largest mfr. of radiator equip., **TRAINS YOU FREE**. Proved merchandising assures volume. Small down payment starts you... Pay-As-You-Profit plan.

NEW INLAND BENCH With ELECTRAMATIC Drive & Brake

FREE!
32-page booklet "Blueprint for Profits" shows equip., prices, owner letters.

TESTS & REPAIRS

INLAND MFG. CO., Dept. PM-11

1108 Jackson, Omaha, Nebr. 68102

Send free 32-page booklet and money-making plan.

Print Name _____

Address _____

City _____ State _____

75 POWER TELESCOPE 25X-45X-75X \$398

NEW 3 in one telescopes, 3 variable 25X 45X-75X magnification. Brass bound. 25 power for ultra bright images. 45 & 75 power for long range. Guaranteed to bring distant stars, moons, objects, sports 75 times closer.

Most power 751 scope sold anywhere near this amazing low price. American made, 5 sections. Opens 36", closes 1 ft.; contains 4 ground & polished lenses. Can also be used as powerful compound microscope. Mass production enables us to offer telescope complete at \$3.98 postpaid. Money back guarantee. CRITERION CO., Dept. PM-29, 331 Church St., Hartford, Conn.

Two or four-wheel drive
JEEP or SCOUT OWNERS

REPOWER

with V-8 or 6 Cyl. engines. H.D. ADAPTORS for TRUCK, CAR or COMPACT engines. Immediate del. Write, wire or phone TO-DAY. Free details. HOOSIER MACH. Prods. Co. 312 SE 6th Pendleton, Oregon Ph. 276-3442



AUTOMATIC HUBS for your 4-WHEEL DRIVE!

NOT EVEN A BUTTON TO PUSH on these amazing Lock-O-Matic selective drive hubs that automatically engage the front wheels in 4-w.d., automatically disengage them for 2-w.d. They stop front drive drag, save gas, gears, tires in 2-w.d., automatically! For *Lock-O-Matics—or popular Warn® Locking Hubs—see your dealer.

be happy—GO LOCK-O-MATIC!
WARN MANUFACTURING CO., INC. 9050-A Empire Way So. Seattle, Wash. 98118



AUDEL GUIDES

- No. 8 Carpenters & Builders Guide, 4 Vols. 1900 pages...\$16.50
- No. 1 Auto Mechanics Guide, 1132 pages..... 6.00
- No. 15A Electric Library, 10 Vols. 5558 pages..... 25.00
- No. 2 Home Appliance Service Guide, 632 pages..... 6.95
- No. 14 Refrigeration & Air Conditioning Guide, 1090 pages..... 8.00
- No. 25 Masons & Builders Guide, 4 Vols. 1440 pages..... 16.50
- No. 6 Plumbers & Steamfitters Guide, 4 Vols. 1833 pages..... 16.50
- No. 3 Radio-TV Library, 2 Vols. 960 pages..... 9.50
- No. 12 Machinists & Toolmakers Handy Book, 1256 pages..... 6.95
- No. 10 Welders Guide, 606 pages..... 4.95
- No. 49 Outboard Motor & Boating Guide, 414 pages..... 4.00
- No. 4 Handy Book of Practical Electricity, 1052 pages..... 5.95
- No. 25 Blueprint Reading for Mechanics & Bldrs. 430 pgs..... 3.95
- No. 27 Electric Motor Guide, 1038 pages..... 5.95
- No. 11 Mathematics & Calculations for Mechanics, 672 pages..... 4.95
- No. 53 Foreign Auto Repair Manual, 592 pages..... 5.00
- No. 5 Truck and Tractor Guide, 908 pages..... 5.95
- No. 7 Painting & Decorating Manual, 592 pages..... 4.95
- No. 48 Gas Engine Manual, 468 pages..... 4.00
- No. 28 Oil Burner Guide, 420 pages..... 3.95
- No. 9 Diesel Engine Manual, 544 pages..... 6.00
- No. 29 Sheet Metal Pattern Layouts, 1152 pages..... 7.50
- No. 54 Programmed Basic Electricity Course, 272 pages..... 4.00

10 DAY FREE EXAMINATION. SEND NO MONEY. We'll send you Audel Guides for FREE trial. If you decide to keep the books you pay only \$3 per month under our easy-pay plan. Simply circle the books you want, below, and we'll send them at once. If you're not completely satisfied, return them to us.

THEODORE AUDEL & CO., Since 1879 P-115
4306 W. 62nd St., Indianapolis, Indiana 46206

Please mail me for 10 days FREE EXAMINATION the books circled below. I agree to mail \$3 in 10 days for each book or set ordered, and to mail \$3 a month for each book or set, until I've paid the purchase price, plus shipping costs. If I'm not completely satisfied with my Audel Guides I may return them.

Name _____

Address _____

Employed by _____

- 1 2 3 4 5 6 7 8 9
- 10 11 12 14 15A 25 26
- 27 28 29 48 49 53 54

☐ **SAVE SHIPPING COSTS.** Check here if you enclose complete payment (plus sales tax, if any). We pay postage.
☐ I've bought Audel books before.

MAIL COUPON TODAY!

ONE-MAN SAWMILL LOW \$50.00 AS...50.00 DOWN



Take BELSAW Portable Sawmill right to the trees—turn out valuable lumber for home and farm—sell to local yards—make up to \$50 a day cash saving for neighbors. BELSAW lasts a lifetime. No crew needed. Power with tractor or auto engine. Beginners get excellent results. Send today for FREE BOOK.

BELSAW MACHINERY CO.
14356 Field Blvd. Kansas City 11, Missouri

FREE BOOK



Learn Profitable Profession in few months at Home

MEN AND WOMEN, 18 TO 60

\$4.00 to \$5.00 for 1-hour treatment is the established charge for a skilled operator. Easy to learn and do. Diploma awarded. Open your own office or earn good income from Doctors, Hospitals, Clubs and other health or recreational centers. Wonderful part-time profession. Low monthly payments. Write today for free Anatomy Charts and catalog. No obligation.

ANDERSON SCHOOL OF SCIENTIFIC MASSAGE
Dept. O-1, Princeton, Illinois

PROFESSIONAL TAX CONSULTANTS

► EARN BIG MONEY FASTER ◀

Clean, dignified, high pay Tax Consultant Practice waiting for trained graduates. Busy tax season pays \$1,000 to \$3,000 for spare time work... leads to profitable year-round Tax Service Business with monthly fees of up to \$50 per client. No previous experience. Low cost home training course, shows you the way. Licensed by N.Y. Education Dept. and Accred. by Nat'l. Home Study Council. Write for FREE LITERATURE. No obligation. No salesmen.

NATIONAL TAX TRAINING SCHOOL, Monsey, G-20N. Y.

MAKE MONEY! REPAIR HYDRAULIC JACKS



Earn while you learn at home. Trained and qualified mechanics needed NOW to service inoperative hydraulic jacks. BIG opportunity for ambitious men. We show you HOW—in your basement or garage, spare time cash income in an expanding industry. Don't wait, ACT NOW! Get the facts.

Write for Folder P.M.11 and Free Bonus Offer

Hydraulic Jack Repair Manual Co.

P. O. BOX 50 • BLOOMFIELD, N. J.



DRAINS collars, cisterns, wash tubs; \$8.95 IRRIGATES - CIRCULATES - SPRAYS

1,001 uses. Stainless shaft. Won't rust or clog! Use 1/8 HP motor or larger... 3/4 HP for up to 2,400 GPH; 450 GPH 80" high; or 1,800 GPH from 25" well. 1" inlet. \$2.95. HEAVY DUTY BALL-BEARING PUMP. Up to 5,200 GPH; or 3,000 GPH from 25" well. 1 1/2" inlet. 1" outlet. \$12.95. Postpaid if cash with order. MONEY BACK GUARANTEE

Centrifugal and Gear Pumps in All Sizes

LABAWCO PUMPS, Belle Mead 7, New Jersey

NEW RUBBER STAMP BUSINESS PAYS BEGINNERS UP TO \$9.20 AN HR. START AT HOME IN SPARE TIME

The multi-million dollar Rubber Stamp business—once controlled by a few big companies—is now being taken over by small operators—one in each community throughout the United States. Men and Women who have this inexpensive machine can turn out huge quantities of Rubber Stamps with special wording that buyers once were forced to buy from big cities. Material costing only 27¢ makes a stamp that sells for \$1.80. The machine that does the work is simple and easy to operate and it turns out as many as six Rubber Stamps at a time, each with different wording such as names, addresses, notices, stock numbers, prices and other "copy" needed by offices, factories and individuals. Working full capacity, it can earn as much as \$9.20 an hour for the operator! Now you can get into the big-pay business yourself, with your own home as headquarters. You don't need experience. We supply everything, including complete instructions and eight ways to get business coming in fast. We even help finance your start. Start making up to \$9.20 an hour from the very beginning. Cash in on the profitable Rubber Stamp business in your community, right away. We'll mail full particulars FREE and no salesman will call. Be first in your locality. Rush coupon or send your name on postcard now to:

RUBBER STAMP DIV., Dept. R-2-MW
1512 Jarvis Ave. • Chicago, Illinois 60626

ARE YOU MAKING ALL THE MONEY YOU CAN?

U.S. DEPT OF LABOR CITES IMMEDIATE NEED FOR SKILLED TECHNICIANS

Prepare for the better paying jobs at the World's largest, most modern and best equipped Trade School. Greer's expert instruction and actual shop training teaches you how. Job placement aid and help in obtaining convenient living accommodations nearby. Resident training and Home Study courses. Over 100,000 successful graduates.

ACT TODAY

CHECK JOB YOU WANT AND RUSH THIS COUPON

- | | |
|---|---|
| ☐ AUTOMOTIVE MECHANICS | ☐ ENGINEERING DRAWING* |
| ☐ AUTOMATIC TRANSMISSIONS* | ☐ BLUEPRINT READING* |
| ☐ MOTOR TUNE UP* | ☐ TWO YEAR AUTOMOTIVE AND DIESEL TECHNOLOGY* |
| ☐ BODY & FENDER REPAIR* | ☐ TRUCK DRIVER TRAINING |
| ☐ DIESEL MECHANICS | ☐ HEAVY EQUIPMENT |
| ☐ MACHINIST, TOOL & DIE* | ☐ PERATORS |
| ☐ REFRIGERATION & AIR CONDITIONING | ☐ CONSTRUCTION EQUIPMENT MECHANICS* |
| ☐ GAS & ARC WELDING | |
| ☐ HELIARC WELDING | |

NAME.....Age.....
ADDRESS.....
TOWN.....STATE.....
*Resident Courses Only. ☐ Resident ☐ Home Study

GREER TECH INSTITUTE Est. 1902
Box K 2236 S. Michigan Ave., Chicago, Ill. 60616

REAL ESTATE BROKER

PAYS BIG! SEND FOR FREE, BIG, ILLUSTRATED CATALOG NOW! Graduates report making substantial incomes. Start and run your own business quickly. Men, Women, all ages, learn easily. Course covers Sales, Property Management, Appraising, Loans, Mortgages, & related subjects. STUDY AT HOME or in classrooms in leading cities. DIPLOMA AWARDED. Write TODAY for FREE Booklet! Accredited Member National Home Study Council. (Established 1900)

FREE BOOK TELLS HOW

WEAVER SCHOOL OF REAL ESTATE
3521-P Broadway Kansas City, Mo. 64111

THIS LITTLE TABLE TOP MACHINE MAKES EVERYTHING SIMPLE & EASY



MAIL THIS

RUBBER STAMP DIV.

1512 Jarvis Avenue Dept. R-2-MW, Chicago, Ill. 60626

FREE!

Please rush full particulars about your financing plan and the little machine that can get me started in the profitable Rubber Stamp business at home in spare time. Everything you send me is FREE and no salesman will call.

Name.....
Address.....
City.....
Zone.....State.....

CLASSIFIED ADVERTISEMENTS

Rate: \$1.40 per word payable in advance each insertion. Minimum insertion ten words. To be inserted under the proper classification, copy must be in our office by the 15th of the second month preceding date of issue. The next available issue to place an advertisement in America's No. 1 Classified Section is January. The closing date is November 15. Send remittance and order to C. A. Martin, Popular Mechanics, 575 Lexington Avenue, New York, New York 10022.

POPULAR MECHANICS

CHRISTMAS GIFT SHOPPING

MECHANICAL Pencil calculator. Adds, subtracts, multiplies, divides, square roots. 6 1/2" x 1 1/2" in gold anodized aluminum casing. \$2.95 ppd. No CODs. Jack Weiser, 1417 S. Fairfax Ave., Los Angeles 19, Calif.

1,000 GUMMED Address labels. \$1.00. Walt's, Box 966A, South Bend, Indiana 46624.

SOLAR Powered radio kit, \$3.95. Lectronix, Box 42, Madison Heights, Mich. 48071.

CANNONS: Decorative, ten inch, bronze and oak naval miniature—fires black powder! \$20.00. Information, 10c. Adventure Inc., Box 111, Riverside, Ill.

TWENTY Beautiful worldwide colorful seashells mounted in collection box plus 160 page book—700 color illustrations. Tremendous value, \$3.75. World of Wonders, 4054 Sunnydale Station, New York 11104.

GIFT-TIME! Fall-Xmas. Full color catalog. Free! J. G. Norcini, 699 N. Wayne Ave., Wayne, Pa. 19087.

AUTOMOBILES, MIDGET CARS

AUTOMOBILE Literature, antique, classic, rare reprints. Non-profit hobby club. Free information. Enthusiasts, Box 451B, Mt. Clemens, Mich. 48044.

1965 CARS, \$895. Fords, Dodges, Four-door, 6 cylinder, automatic transmission, heaters. Choice of color. 1964 cars, \$595. Guaranteed motor, transmission, rear end. Nationwide delivery. Free illustrated catalog, details. Write: Dept. A2 Consolidated Auto Wholesalers, 120 East 56 St., New York 10022.

WORLD'S Largest model car & racing catalog representing 90 manufacturers. 50c refundable. Auto World, Box 961-PM, Scranton, Penna.

AUTO SUPPLIES AND EQUIPMENT

CROSLLEY New, used, parts, Discounts. Catalog, Box 7, Elmont, N.Y.

SAVE \$150! Ring-valve job while driving. \$6.00 postpaid. Safe! Guaranteed! Many mechanics recommend. Motoloy, Grantham, Penna. 17027.

JEEP Parts! For military and civilian. At great savings. Largest inventory. Catalog for owners and dealers. Inquiries invited. American Auto Parts Co., 1830-PM Locust, Kansas City, Mo.

JEEP Owners—V8 conversions. Read Jeep Owners ad, page 64.

AUTO Welding repair training in world's largest non-profit welding school. Low tuition. Free booklet. Hobart Welding School, Box M-115, Troy, Ohio.

ANTIQUE Car pistons, gaskets, gears, valves, etc. Catalogue \$1.00. Antique Auto Parts, Milwaukee, Wisconsin 53204.

COMPACT Oil reclaiming plant. Plans, \$2.00. Details Free. Holcomb, Box 681, Pampa, Texas 79066.

ELECTRONIC Ignition. Only \$9.95! Guaranteed! Inquire: Box 405P, Syosset, N.Y. 11791.

OWNERS—Corvair, MG1100, Saab, Volkswagens; Superior traction, maneuverability make your car ideally suited to snow-plowing. Plows, specifically engineered for your car, complete with power lift—controls—only \$135.00. Attach—detach complete plow—lift unit in one minute. Give year, make car. Send 50¢—balance COD. Damnyankee Enterprises, Dept. 22PM, 46 Smith St., Torrington, Connecticut.

FOREIGN Car parts, Discounts. Catalog, Box 7, Elmont, N.Y.

\$100.00 WEEKLY Spare time selling Banhee TS-30 transistor ignition systems. Big demand. Demonstration discount. Free colorful money making brochure. Slep Electronics, Drawer 178PS, Elletton, Florida, 33532.

VOLKSWAGEN—Parts, tools, accessories, German radios. Free catalog, 5000 items. Diana Imports, Ferndale, Michigan.

SPINNING Snow, stuck, stranded! Newly invented Snomat arches snugly against spinning wheel, out of snow you go. Moneyback guarantee. Prepare now. Send \$1.50 (postpaid) Snomat, Box 617A, Franklin, Michigan.

ESKIMO Snow-ice steel tire traction mats, includes polypropylene rope, hooks, most practical gift, \$3.98 pair. Postpaid. Laval, 103 Commissioners East, Montreal, Canada.

AVOID Collisions and highway fatigue. Free brochure, refund guaranteed, \$4.55. Left Accelerators, Box 25468, Houston 32, Texas.

SNOW Plows for pick-ups and jeeps. \$169.00 including power lift. Circulars and photos 10c. Stratford Fabricating Co., Seymour, Stratford, Conn.

"PIC-UP" Gasoline additive supply. \$1.00. Nead, Box 333, San Gabriel, Calif.

NEW And used parts savings. Complete guaranteed service all model cars and trucks. Largest in west. Jeep and Army parts specialists. Shifting hubs for all front-end drive vehicles. \$27.99 up. Foreign parts. Fast service. Pioneer, 734 W. 13th Avenue, Denver, Colorado 80217.

AUTO TRAILERS

PICKUP Camper, trailer or pickup-cover. Build yourself, save! Complete plans \$3.95 each. Bus conversion (and houseboat interiors) Drawings \$2.95. Equipment catalog, \$1.00 (refundable). Satisfaction Guaranteed. Details 10c. Viking Camper Supply, 84-F Glenwood, Minneapolis, Minn. 55403.

BUILD Aluminum pickup camper over-cab, hi-boy, lo-boy, blueprints, material, list, 2 models included, \$3.00. Custom Camper, 1500 S. Dallas, Auburn, Indiana 46706.

TRAVELPAK Cartopper camper, fits most cars. "Installation-service" distributorships available. Write Cartopper, Box 123PM, Napoleon, Ohio.

PRE-Cut pickup camper kits. Ready to assemble. Literature, 15c. Snowy Mountain Campers, Lewistown, Montana.

BUILD Inexpensive compact bus camper unit: Volkswagens, Econolines, Dodge, ChevyVan, Literature. Dot Campers, Box 67M, Saugus, California.

BUILD Camping travel trailers. Illustrated circulars 25c. Kamcraft, Box 1153 Milwaukee 1, Wis.

BUILD Your own—Save! Econoline camper plans, foldout trailer, or bus conversion drawings, including materials catalog, \$2.95 each. Guaranteed satisfaction. Catalog, \$1.00 (refundable). Details, dime. Campers, Box 263-F, Hopkins, Minn.

PICKUP Campers. Pre-cut kits. Blueprints. Supplies. Literature 10c. Comstock Trailers, Parsons 4, Kansas.

MOTORCYCLES, BICYCLES, MOTORSCOOTERS AND SUPPLIES

RECONDITIONED Motorcycle motors. Large stock Indian Cushman Vespa Mustang NSU parts. Indian Motorcycle Sales, Kansas City, Missouri. 64127.

BUILD Motorbike from Bicycle! Plans, \$1.00. Go-Byk Industries, Rothsays, Minnesota 56759.

HARLEY-Davidsons—Used bargains. New, used parts, accessories, all models. Bulletin 25c. Knuth's (Factory Dealer), 1753 Muskego, Milwaukee, Wis.

KART \$8. Minibike frame \$7. less engines. Engines \$5 up. Whizzer \$15. Three wheeled motorscooter \$30. Kart \$20. Volkswagen Chassis \$75. (Mailorder only.) Send 25c. (35c for first class mailing) for directory-catalogue number 126, listing these and hundreds of other bargains, home-builders parts, plans, etc. Midket Motors Directory, Athens, Ohio.



AVIATION

HOMEBUILT. Real enclosed helicopter. 24 pages ideas, information, \$2.00. Build "executive" helicopter, drawings, specifications, \$1.50. Helicopter Development, Box PM147, Washington, New Jersey.

BE A Government licensed aviation mechanic. Practical training. Free information. Aero Mechanics School, Municipal Airport, Kansas City 16, Missouri.

AIRBOAT—Snowplane propellers, plans, kits, supplies. Gauges, throttles, spark plugs, gas-oil hose, oil coolers, primers, wrenches, switches. (Mailorder only.) Send \$1.00. Details, 10c. Viking Camper Supply, 84-F Glenwood, Minneapolis, Minn. 55403.

FREE Catalog aviation/space books. Aero Publishers, Inc. 329 PM Aviation Road, Fallbrook, California 92028.



BOATS

BOAT KITS! Factory molded fiberglass or pre-assembled plywood, 50 models, 12' to 30'. Free catalog, Luger, Dept. BC-65, 9200 Access Road, Minneapolis 31, Minn.

BOAT Plans, frame kits, full size patterns all prepared specially for amateurs. Send 50¢ for new catalog illustrating 55 proven designs including sail, inboards and outboards from 7' to 28'. Glen Designs, 9152 Rosecrans, Bellflower, Calif.

KAYAKS—One man \$16.50; two-man \$22.50; sailboat \$39.00. Exciting Sitka Kayak kits known world wide for speed and safety. Assembled in one afternoon. Free pictorial literature, Box 78-P, Brecksville, Ohio 44141.

CANOE KITS—Everything furnished in kit to make handsome, sturdy canoe. Canvas covered and can be Fibre Glassed. Easily assembled. From \$28.50. Free literature, Trailerkit, Box 51731, Glasco, Kansas 67445.

205 Boat Plans also patterns, kits, Catalogs. Powerboat large \$1.00, condensed \$50¢. Sailboat 40¢. Fiberglass, Box 161-M, Brighton 35, Mass.

FULL Size, cut-to-shape boat patterns. blueprints, 7½-38 feet. Big new illustrated "Build a Boat" catalog of 64 designs, including catamarans, cruisers, runabouts, skiffs, outboard boats, sailing, racing, houseboats, 50¢. "How to Build a Boat" booklet, \$2.50. Cleveland Boat Blueprint Co., Box 18250, Cleveland, Ohio.

BETTER Bonding dymel fabric for lamination. Send for brochure. Noone Fabrics, 1495 Westport Turnpike, Westport, Conn. 06883.

TRIMARANS. Catamarans. Range proved building plans. Erick Manners, Riverside, Martham, Gt. Yarmouth, England.

BUILD Your own boat from our large-scale blueprints. Books of plans give how-to-build help. Hundreds of professional designs—motor sail or for amateur builders. Free catalog, MoToR Boating, 950 Eighth Ave., Dept. RS, New York 19, N. Y.

MARINE EQUIPMENT AND SERVICES

NEW. Used, rebuilt marine motors. Marine conversions, fittings. Free catalog. Stokes Marine Supply, Dept. 24, Coldwater, Michigan.

MARINE Conversions. Ford, Chevrolet, Jeep engines. Catalog 25¢. Lehman Manufacturing Company, 600 Elizabeth Avenue, Linden 4, N.J.

KITS—You can build inboard engine from Chevrolet, Ford, etc.—Big catalog tells how, 50¢. Star Marine, Berkeley 10, California.

ATHLETIC AND BODY BUILDING COURSES

"GIANT Arms." Dr. Young's, D.C. revolutionary discovery, \$2. Satisfaction or refund. Oaucho, Box 9309-S7, Chicago 90.

BAR BELLS. Exercise equipment, key to health, strength, physique, 25¢. Reading Barbell Co., West Reading, Pa.

JUDO—Karate unarmed self defense. \$1.00. Box 2372, Kansas City, Mo. 64142.

BE A champion wrestling! Tear phone books, etc. Develop terrific power for gripping, crushing, bending, twisting, tearing, pulling with special equipment you can easily build yourself from odds & ends. Instructions & illustrations, 2 dollars. Linder Enterprises, P.O. Box 319, Cherry Hill, N.J.

SPORTING GOODS AND EQUIPMENT

GOVERNMENT Surplus Bargains. In gun, ammunition, edged weapons, hunting, camping, fishing items. Write for giant free catalog, P & S Sales, Box 155, Tulsa, Oklahoma.

BIG Money raising crickets and 12 inch African fishworms. Free literature, Carter Ranch, Plains, Georgia.

SURPLUS Army carbines, \$17.50; pistols, \$12.50. Catalog, 25¢. Armco, Santa Cruz, Calif. 95062.

SILENCERS. Pistols, rifles. Details construction, operation, \$1.00. Gunco, Soquel, Calif. 95073.

BASEBALL Pitching machines and netting for batting ranges, leagues, home practice. Ideal part-time or retired business. Allstar, 9025 Sepulveda Blvd., Sepulveda, Calif.

EMBLEMS Embroidered. Quotations your sample. Nord, Box 565, Tuxedo Park, New York 10987.

KARATE. Judo supplies, 29 page catalog, 25¢. Nosawa Trading, 232 East Second Street, Los Angeles, Calif. 90012.

FREE! World's largest sporting goods discount catalog—88 pages of guns, ammo, scopes, reloading equipment, camping gear, fishing tackle and 1000's of items priced wholesale or below! Maryland Arms Company, Box 7888, Dept. PM, Baltimore, Maryland.

50,000.000 GUN Parts for modern, obsolete, foreign, domestic military and sporting arms. Write wants for quote—make, model & # specific part. Speed reply—include stamped self addressed envelope. Numrich Arms, West Hurley, N.Y.

JIFFY Powered ice fishing drills. Easy, fun. From \$99.35. Feldmann Company, Sheboygan Falls, Wisconsin.



FISHING, TACKLE, LURES

MOLDS For fisherman's sinkers, jigs, squids, casting and spinning lures. Free catalog, Sweet's Molds, Tonawanda 1, New York.

FREE . . . Wholesale catalog. Beads, Spinners, Lure parts, Sinker molds, Jigs, Reels, Finnyports (ME), Toledo, Ohio 43614.

MOLDS For casting your own fishing sinkers. Free illustrated booklet. Reading Instrument Co., Box PM78, Reading, Penna.

PIKE Jigs & lures \$1.00. S & G Lures, RD 1, Clay, N.Y.

EARTHWORMS, LIVE BAIT

MEN!—Women! Make money raising bait for us at home. Wigglers, Warsaw 45, Indiana 46580.

SUCCESS For you! Raise fishworms and crickets. Write for free literature and our success story in Life Magazine. Let us teach you our secrets of success. Hybrid redworms 3000, \$5.95. Carter Redworms, Plains, Georgia.

BIG Profits Raising Redworms. Crawlers—Soilless method. Three Oaks Ranch, Dresden, Tenn.

RED Wigglers: Select breeders or fishing size \$3.50-1,000; \$14.25-5,000; bed-run \$9.95-10,000. Postpaid. Free folder "Growing Fishbait." Pain's Bait Farm, Box 56C, Edison, Georgia.

EARN Money raising fishworms for us! Exciting details free! Oakhaven—56, Cedar Hill, Texas.

FROGS, FISH, REPTILES

LIVE Seahorses, marine specimens aquarium supplies. Illustrated catalog 15¢. Marine. P.O. Box 626-110, Dania, Florida.

FROG Raising. Young frogs and giant breeders. Stock your lakes, pond Nu-Tex Frog Farm, Box 4029, Corpus Christi, Texas.



HUNTING, GUNS, DECOYS

ANTIQUE & modern military arms and equipment, largest selection of military goods in the East . . . guns, swords, edged weapons, hats, helmets, insignia, uniforms, books, medals and accessories. Fully illustrated Catalog—\$1.00. ZM Military Research Co., Inc., Dept. PM, 80 Nassau St., New York, N.Y. 10038.



DOGS AND KENNELS

GUARANTEED Hunting hounds, reasonable. Catalog, 10¢. Clayco Kennels, Henrietta, Texas.



GAME BIRDS

YOUR Ad in this space will be read by more than 1,400,000 active mail order buyers. Join the march to greater profits, place your products and services in front of them today with a small low cost classified ad. For further details, write: C. A. Martin, Dept. 15N, Popular Mechanics, 575 Lexington Avenue, New York, New York 10022.

RABBITS—FUR BEARING ANIMALS

RAISE Rabbits on \$500 month plan. Free details. White's Rabbitry, Mt. Vernon, Ohio.

EARN \$10,000 yearly raising Angora rabbit wool for us. Information 25¢ coin. American Angora Company, Malta 12, Montana.

RAISE Rabbits successfully by knowing facts. 48 page illustrated book describing 25 breeds, housing, breeding, feeding, markets, marketing etc. 25 cents. American Rabbit Association, 36 Arba Building, Pittsburgh, Penn.

MINK. Free booklet. Book On Mink. \$1.00. Sno King Mink Ranch, Brigham City, Utah.

MINK Raising information free. Lake Superior Mink Farm, Inc., Superior EE1, Wisconsin.

PETS—BIRDS, CATS, HAMSTERS, ETC.

MAKE Money raising chinchillas, mink, rabbits, cavies for us. Free catalog. Keeney Brothers, New Freedom 2, Penna.

HAWSK. Reptiles, raccoons, skunks, squirrel. Catalogue 25¢. Trails End Zoo, St. Stephens, S.C.

PETS. Hamsters, mice, monkeys, squirrels, chipmunks, guinea pigs, skunks, raccoons. Picture catalog twenty-five cents. Moore's Hamster Ranch, Shepherdstown 25, West Virginia.

CAMPING EQUIPMENT AND TENTS

INDISPENSABLE For northeast camping. "Campers' Guide to New England and New York State," 12th Edition, \$1.50 postpaid. Outdoor Publishers, Box 155M, Rocky Hill, Conn. 06867.

CAMPING Equipment, unusual selection. Morstan's own quality tents (200 styles) finer fabrics, sleeping bags (80 styles); every camping convenience imaginable. Free giant catalogue-guide-handbook. Morstan, 810-R Route 17, Paramus, New Jersey.

TRAVEL AND RESORTS

TELL The more than 1,400,000 avid readers of Popular Mechanics about your hotels, lodges and travel services. It costs very little to place your classified message in front of these hunters, fishermen, vacationers. For further details, write: C. A. Martin, Dept. 18N, Popular Mechanics, 575 Lexington Avenue, New York, New York 10022.

ELECTRICAL SUPPLIES

LAMP. Electrical parts, wholesale. Thousands of items for repairing, converting. Catalog 35¢. Brown Lamp, Box 395, Clayton 3, Missouri.

LAMP. Appliances parts. Wholesale catalog, 25¢. SECO, 112 South 29th Street, Birmingham, Alabama 35233.

LAMP Parts. Catalog, prices, wiring instructions. 50¢. Refunded first order. Gyro, 5208P N.W. 35 Ave., Miami 42, Fla.

BARGAINS Galore! Motors! Generators! Supplies! Instruction manuals! Modern. Box 10025, Kansas City 11, Mo.

METERS—Surplus, new used, panel and portable. Send for list. Hanchett, Box 1898, Riverside, Calif.

BATTERIES, GENERATORS

ILLUSTRATED! Battery rebuilding manual. \$3.00. Supply catalog. 25¢. Battery charger repair manual. \$2.00. All for \$5.00 P.P. Control Battery Equipment, Box 7154, Montgomery, Alabama.

BATTERY Saver—VX-6 additive makes batteries stronger, last longer. Guaranteed. \$2.98. A & I Battery Service, 549 Sherman, Leavenworth, Kansas 66048.

COMPLETE Rebuilding Manuals! Batteries \$3.00. Hydraulic Jacks \$3.00. C.O.D. accepted. Bayer Publications, 938 Betty Avenue, Neenah, Wisconsin.

BATTERY Reconditioning kit. Includes molds, material, complete instructions. The Battery Shop, P.O. Box 416, Palm Desert, Calif.

ENGINES, MOTORS, DYNAMOS

WINDING DATA. 275 motors, single and three phase \$1.10. Data Company, 512 Kensington, Kansas City 24, Mo.

OPERATE 3-phase motors from single phase. Plans \$1.00. Donald Howell, Barnesville, Ohio.

STEAM Power kits, leaflets. 25¢. Reliable Steam Engine Co., New Baltimore, Mich. 48047.

REWIND Motors yourself. Complete instructions. \$1.00. Lewis Manufacturing, Howell, Michigan.

MACHINERY, TOOLS AND SUPPLIES

BRONZE. Aluminum foundries, 5 sizes. Free information. Pyramid Products, Box 65, Fayetteville, Arkansas.

FACTORY Prices! Brand new, first quality, fully guaranteed saw chain low as \$10.00; hardwood bars from \$14.00. Big savings on parts, accessories for all makes of chain saws. Free catalog. Zip-Penn, Box 179NB, Erie, Pennsylvania 16512.

MACHINISTS: Miniature parts and dimensions measured ten times more accurately than with steel scale. New inexpensive pocket tool. Mail two \$4 stamps for catalog. 50¢ rebate on order. Finelace Company, Dept. 1, 3258 West Sixth Street, Los Angeles 90005.

SPLIT Rocks—2000 degree kerosene torch. 99 practical uses. Destroys stumps, stumps, dries concrete. Free literature. Sine, PM2, Quakertown, Pa.

"SMALL Shop Supplies." Production-hobby Machinist Tools, 1424 Barclay, Springfield, Ohio 45505.

WEN Professional power tools at lowest prices. Send for complete catalog of Wen heavy duty power tools and accessories. Orders shipped promptly. B&B Wholesale, Three Forks, Montana 59752.

LATHE 12" x 51" \$33. Alda Power Tools, 101 Masonic, San Francisco, Calif. 94118.

MACHINISTS. Toolmakers chests. Circular file. Cepador, 4715 Spencer, Lisle, Ill.

HARD-To-find tools. finest quality. Catalog, 106. Brookstone, Worthington 6, Massachusetts.

BAND Saws 12"—18"—24" sizes. Request bulletin. Paul Kornau, 6503 Hamilton Ave., Cincinnati, Ohio 45224.

STANLEY, Millers Falls, Skill, Disston, Wiss, Plumb, Channellock, Bonney, Herbrand, Rigid, and hundreds of other nationally advertised brands at prices hard to beat. Send 25¢ for our big tool catalog today! Silvo Hardware, 107PM Walnut, Phila. 6, Penna.

WELDING, SOLDERING, PLATING

WELDERS. 150 Amperes, \$49.50. Paul Morris, 1070 Inner, Schenectady, N.Y. 12303.

CHROME Plating equipment supplies. All other finishes. Home workshop and production sizes. Send \$1.00 (refundable) for formulas, operating data, equipment guide and catalog. HBS Equipment Division, Box 500, 3543 East 16th, Los Angeles, Calif. 90023.

GOVERNMENT SURPLUS

JEES From \$53.90, trucks from \$78.40, boats, typewriters, airplanes, sporting equipment, 100,000 Bargains, as is, direct from Government in your area. Complete sales directory and surplus catalog \$1.00. Deductible first \$10.00 order. Surplus Service, Box 820-A, Holland, Michigan.

FREE Catalog—war, government surplus bargains. New stocks received regularly. Save Up to 80%. Clothing, boots, blankets, coats, tents, etc., for farm, home, outdoors. Send postcard today! Sioux Falls Surplus Store, Sioux Falls, South Dakota.

JEES Being sold at bargain prices by Government. For latest information regarding only 2 sale centers still open, send 25¢ to Government Surplus Jeeps, Box 177-PM11, Abbottstown, Penna.

GOVERNMENT Surplus. Complete sales directory \$1.00. Surplus Publications, Box 45781, Los Angeles 45, California.

GOV'T Surplus. How and where to buy in your area. Send \$1.00. Surplus Information, Headquarters Building, P.M., Washington 6, D.C.

FREE Surplus information. Jeeps, guns, typewriters, binoculars, walkie-talkies. Rush 10¢ handling. Enterprises, Box 350-X4, Jamaica, New York 11430.

GOVERNMENT Surplus bargains. Complete buying procedures. All available items (including Jeeps, typewriters, etc.). Send \$1.00. Surplus Department, Suite 528, 142 High St., Portland, Maine.

JEES \$53.90—Trucks, airplanes, thousands of other bargains selling at a fraction of their original costs to the taxpayer. For complete information on how to buy, send \$1.00 sales directory, send only \$1.00 to U.S. Surplus, Box PM 92, Keego Harbor, Michigan.

JEES Have sold low as \$53.90 from U.S. Surplus. Bidders information and our over 400 item (order by mail) Surplus catalog \$1.00. Quality Surplus, 422 (PM-11) Washington Building, Washington, D.C.

JEES \$62.50, autos, boats, thousands of others available used direct from Government! Free exciting details! Global, Box 18216-PK, Indianapolis, Indiana 46218.

CHEEP Jeeps. Buy from Gov't. Full information, 25¢. Box 789PMTF, York, Penna.

WAR Surplus catalogue, generators, pumps, gearboxes, hydraulics, winches, motors, 25¢ stamps or coin. Trader, Box 8PMTF, Thomsville, Penna.

CHEEP Jeeps \$53? Buy one, or hundreds from U.S. Surplus. Official information plus free surplus catalogue. 50¢. Surplus, Box 187PM11, Abbottstown, Penna.

WAR Surplus bargain catalogue. Illustrated generators, blowers, pumps, gearboxes, hydraulics, winches, motors, etc. Send 50¢. Refundable on first order. Surplus Trader, Box 8TFPM, Thomsville, Penna.

FACTS Concerning Government surplus (stamped envelope required). #770(B) Hoboken, New Jersey.

JEES (reparable) \$50. Inspect and bid! 10,000 bargain items available. U.S. Government sales directory \$1.00. (refundable) Surplus Catalogue included. Free Surplus. Box 1563M, York, Penna.

JEES—Jeeps—Jeeps. Direct from Government. Directory and our over 400 item (order by mail) surplus catalog. \$1.00. Quality Surplus, Dept. PM-11, 2546 W. Michigan, Indianapolis, Indiana.

HOBBIES AND COLLECTIONS

50 JUNGLE butterflies \$2.00. Giant nature hobbies catalog 25¢. Collectors Wonderland, Box 1170, New York 8.

COLLECTORS Matchbook covers. 100 different unused. \$1.00. Album \$3.35. Catalog, 25¢. Helene Edelman, 1311-C East 84, Cleveland, Ohio 44103.

INTRODUCTORY Five military emblems and illustrated catalog. 25¢. Foreign Medal. 50¢. 10 Military decals 25¢. Hobbies, Box 71-S, Rockaway 94, New York.



STAMP COLLECTING

U.S. Mint specials! Flag set, complete \$1.00. 1¢, 2¢, 3¢ famous Americans (21 different) \$1.00. Free list. Brooks, 2601 Avenue "U", Brooklyn 28, N.Y.

THOUSANDS Of worldwide sets and singles on approval. Highest quality! Cole, Box 223A, Buffalo, N.Y. 14221.

U.S. Bargain. 50 different 10¢, with beautiful worldwide approvals. Stamps, Kennebunk, Maine.

GERMAN Commemoratives. 10¢ with approvals. Schaefer, Box 1704, Washington 13, D.C.

40,000 DIFFERENT. Amazing new plan builds your collection systematically, country by country. As low as 50¢ weekly. Ware, Monroe 75, Conn.

MILLION Foreign stamps! 2¢ each! Send for thrilling, giant approvals! ABC Stamps, Box 6000-MB, San Francisco 1, Calif.

FREE Surprise collection sent with approvals. Gould, 1784 Union, San Francisco 94123.

25 DIFFERENT United States Commemoratives 1893 up 10¢. Approvals. K&B Stamp Company, Box 70, Brooklyn 23, New York.

105 DIFFERENT U.S. Stamps. 25¢, approvals included. Sheiron, Box 187, Hempstead, N.Y.

BREATHTAKING. 50 Mint Monaco pictorials, multicolors \$1.00. Approvals. Stamp Exchange, Box 103, Fairfield, California.

FREE! Giant Bargain Catalog—New Edition listing thousands of bargains including U.S. and B.N.A. stamps, packets, mixtures, albums, accessories and supplies sent with beautiful approvals. Jamestown Stamp, Dept. E-115PM, Jamestown, N.Y.

WOW! 110 All Different Germany 10¢! Zeppelins, Semi-Postals, Airmails. High values, etc. Giant Catalog, bargain lists included with beautiful approvals and supplies. Jamestown Stamp, Dept. A-115PM, Jamestown, N.Y.

50 YEARS Old. fifteen different United States, over fifty years old—10¢ with approvals. Jaxon, Box 145-P, Brooklyn, New York 11230.

PENNY Foreign stamps neatly mounted in Jumbo boxes in Scott order. Bullot Approval, 154 Coney Is. Ave., Brooklyn 30, New York.

"INVERTED Error." Dag Hammarskjöld 5¢ with Approvals. Belmont Stamps, Washington, D.C. 20015.

RUSSIAN Space set 10¢. Russian approvals. Snedco, Box 68-P, Waldwick, N.J.

50 DIFFERENT Old U.S. Revenue stamps 50¢. Winchester stamps, Box 1592, Mansfield, Ohio 44907.

PIPEX, Tipex, Cipex, Ashville. Four miniature sheets used for \$1.00 if you ask for our bargain priced U.S. approvals. Triboro, 38 Park Row, New York, New York 10038.

133 DIFFERENT Colorful stamps 10¢. approvals. Krehl, 1708 Nebraska, Orlando, Florida.

FREE! Congo triangle set! Boy Scout beauty—25¢ camera, different Approvals. Cambridge, Box 411, Cambridge, Ohio.

100 OLD United States between 1861 and 1935. \$1.00. Roush Stamps, 51 Chestnut, Mansfield, Ohio.

225 STAMPS For only 10¢! This mammoth value includes airmails, pictorials; stamps from strange countries cataloging up to 25¢ each! Also approvals. Mystic Stamp Company, Camden 80, New York.

SELL Your surplus good grade stamps. Write describing fully what you have. Wanoy Shirk, Lebanon, Pennsylvania.

FREE U.S. catalog. Mint = 704-15, \$4.00; 740-9, \$2.00; 850-93, \$4.00; 900-21, 90¢. Sammy Co., 40 Court, Boston, Mass.

500 DIFFERENT STAMPS. \$1.00. Smith, 508-A Brooks, College Station, Texas.

PENNY STAMPS! 1000 Mounted in book at 1¢ each. Trust Stamp Company, P.O.B. 132-P, Jamaica, N.Y. 11435.

ONE POUND VALUE Geo. VI Bermuda, plus 100 worldwide 10¢ approvals. Stevens, Box 105A, Homestead Sta., Brooklyn 29, N.Y.

60 DIFFERENT U.S. (30 commemoratives) 25¢. No approvals. Seidenberg, Salem 169, Oregon.

ABSOLUTELY Free 50 worldwide. Request inexpensive approvals. University Stamps, P.O. Box 326, Pompano Beach, Florida 33061.

AMAZING OFFER! 200 United States stamps—including commemoratives, airmails, high denominations to \$1.00. Only 10¢ to approval applicants! Illustrated bargain lists free. Mystic Stamp Co., Dept. 80, Camden, New York.

PENNY! Approvals! Regardless catalogue! Kloster, 4164 52nd St., San Diego 5, Calif.

CHURCHILL Memorial cover. Valuable collectors' item! Scarce memorial envelope bearing portrait and autograph of the great warrior-statesman. Postmarked with day-of-death cancellation at London, SW1—Post Office serving Houses of Parliament and official residence of British Prime Ministers. Also included to introduce you to the world's most rewarding hobby: (2) New collection of Churchill commemorative issues just released, (3) Illustrated collectors' catalog, (4) Stamps on approval, (5) "How To Collect Stamps" book. Free bonus, complete set of 42 English Kings & Queens! Send 25¢ Kenmore, C-876, Milford, New Hampshire.

163 WORLDWIDE 10¢. Also approvals. Siegel, Box 92-PM, Brooklyn 18, N.Y.

FREE 50 Turkey, 25 Persia plus Kennedy Memorial, 10¢ handling. Approvals. Berchtold Stamps, Troy, Ohio.

64 PAGE U.S. and U.N. catalog free. Stone, 260 Washington, Boston 8, Mass.

FREE Stamp wallet with approvals. Wide selection collection by countries. Clark, Box 28-C, Wilmette, Illinois.

U. S. approvals. Low prices. Eagle Stamps, Romine Ave., Pittsburgh 26, Penna.

TERRIFIC Collection seven complete sets, 10¢ with approvals. Beatties, Box 16052, Tampa, Fla.

FREE Sample. Interesting, illustrated, informative National Stamp News, Anderson, South Carolina 29622.

FREE 25 Rockets to new approval applicants. Tiquet, Box 1496, Denver 1, Colorado.

INTRODUCING Our better United States approvals we offer 15 United States stamps including Columbian, Bicentennials, famous American life, others; only 10¢. Ocean Stamps, Box 64-PM, Brooklyn 29, New York.

10 DIFFERENT Representative civil war confederate stamps. 10¢ approvals. Minuteman, 19 Deering, Lexington, Mass.

1025 DIFFERENT. 1¢.30 with approvals. Klondike, 682 Jefferson, Elgin, Illinois.

215 DIFFERENT U.S. commemoratives. \$1.00 approvals. H. Holub, 18 East 198th Street, Bronx, N.Y. 10465.

100 U.S. and Foreign 50¢. No approvals. R. Oehmke, 16 Tillman, Danville, Ill. 61832.

ATTRACTIVE Triangle set free! Request approvals. Outlast, Box 235, Chicago 50465.

FREE! 1000 hinges! Approvals. Stearns, 405-A South Second, Alhambra, California 91802.

FREE! Gifts to adult collectors! Right now, without obligation, two marvelous Russian sets plus gift coupon with our sensational approval offer. Only 10¢ for handling. Trio Stamps, Box 1806-NM, Grand Central Sta., New York, N.Y. 10017.

500 DIFFERENT. Includes pictorials. 35¢. Approvals. Knopp, Box 1381, Bristol, Conn.

115 SPACE. Animals, flowers, etc. 10¢. Approvals. Stamp Farm, 3844, Oxford, Wis.

SPECIAL Triple offer—111 all different stamps—35¢ all different topics—full year's membership in Las Vegas Stamp Society—All for \$1.00. Our system puts your duplicate stamps to work for you, and gives you full catalog value for same. Kinnear 558A, Oakley Boulevard, Las Vegas, Nevada 89105.

USA Mint P-25—31 \$3.00. Cooper, Box 375 M, Oak Park, Mich. 48237.

COLORFUL Mint set 10¢. Approvals. Forgiene, 280-C De Witt, Belleville, New Jersey, 07109.

FREE Monaco nudes. Approvals. Stamp Ranch, 902 Addison, Chicago 13, Ill.

SPECIAL Get acquainted offer. Spectacular collection of 25 new African State stamps plus 2 highly priced max. cards—Fremont Kennedy with Chancellor Adenauer and Berlin Mayor Brandt—both with historic special cancellation showing U.S. emblem. A better \$2.00 value. Yours for only 25¢ to introduce our better approvals. Quality Stamps of New England, Dept. B-11, 21 Elm St., Andover, Mass.

FREE 100 Worldwide with penny approvals. 10¢ handling. Skytop, Box 1022-PM, Binghamton, N.Y. 13902.

10 U.S. over sixty years old. 10¢. Robert Gallup, Albany, New York 12201.

SPECIAL 10 Mint Monaco Catalogs 50¢. Our price 25¢ to approval applicants. Elka, Stamps, P.M. 210 Jewett Ave., Jersey City, N.J. 07304.

BARGAIN Topical lists free. Wisehart, 3105 West Broad, Columbus, Ohio 43204.

UNITED States commemorative collection containing 33 different—10¢. Approvals. White, 516-A Avenue L, Brooklyn 30, New York.

\$2.00 CONGLAMERATION includes mixtures, packets, discontinued. Approvals. Norge, Ho-Ho-Kus, N.J.

100 WORLDWIDE, 10¢—Approvals. Jayne, 510 N. 30th Ave., St. Petersburg 4, Fla.

ATTRACTIVE. Mint Indonesian pictorials, plus bargain catalogue featuring U.S. stamps, packets, accessories, 10¢ with approvals. Byrdahl, Box 1293-KM, Seattle, Washington 98111.

SENSATIONAL! Set Cameroons (Triangles), Brunel, Honduras, Paraguay, Nigeria, Algeria, and 100 Different Others. Everything 10¢ with Approvals. O'Keefe, 7517 Merid Avenue, Dept. 55, Chicago, Illinois 60649.

250 DIFFERENT Scandinavian stamps. dollar. Tarkepa, St. Perag 49, Norrköping, Sweden.

25 DIFFERENT U.S. commemoratives. 10¢ with sensational worldwide approvals. Broad, Box 866, Lexington, Kentucky 40501.

DEALERS Wholesale list. Postage 5¢. Frank 5013 Queensberry, Baltimore, Maryland 21215.

25 GIANT Poland commemoratives 10¢. Approvals. Robbins, 486 Shiloh, Dayton, Ohio 45415.

FREE Gift with worldwide approvals. Gail, Box 96PMF, Coopersburg, Penna.

FREE. Twenty different stamps. Approvals. Tv, 609 Cranberry, Erie, Pennsylvania.

12,000 PENNY Approvals waiting for you. Many from exotic countries, pictorials airmails, new issues. Tibury, Box 862, Newark 1, N.J.

500 PINE Mixed U.S. 15¢. Wright, Box 753-M, Hagerstown, Maryland.

PINE Stamps! Large bargain lot. \$1. Giant Assortment. \$5. High Value Packet. \$3. Literature, coupons, free. Persile, 436 N.Y. Ave., Brooklyn 25, N.Y.

FREE—Albums, philatelic supplies—collections. Details, 10¢. Superior, Litchfield, Ohio 44253.

200 EXTREMELY Old and scarce U.S. stamps from 1873 to 1923 inclusive \$1.00. 700 \$3.00, 1000 foreign from 1860 to 1940 \$3.00, 5000 \$12.00. No approvals. Meyers, 5321 Fleming, Richmond, California.

WINSTON Churchill complete mint set of 8 from government-in-exile plus 48-page Stamp Dictionary given free! With approvals. Stampex, Box 47-BM, White Plains, N.Y.

PAKISTAN 25 Different, 10¢. Approvals. Hijo, Box 505, Norristown, Pa.

TRUNKFUL 25,000 Indian-Lincoln cents mixed (from the 1020's & older). Grab-bag style, 400 mixed, \$25.00. Sample bag of 20, \$2.00. Mrs. Fischer, Box 5490, Sherman Oaks 1, California.

50 DIFFERENT United States Commemoratives 25¢ with fine U.S. approvals. Deser Co., Box 2159, Lancaster, California 93535.

THOUSANDS Stamp stamps 2¢ each! Write for gigantic selection. Ernest, 1794 Union, San Francisco 94123.

UNBEATABLE Offer—stamps from Afghanistan, Angola, Dubai, Fiji, Gabon, Greenland, Iceland, Macao, Maldives, Rwanda, Ryukyu, Somalia, Swaziland—Countries missing in most collections, plus set 4 Sports diamonds from Monaco, only 10¢ with approvals. Moulbourn, 190 Cedarhill, East Northport, New York 11731.

100 DIFFERENT Free! 1/4¢ Upwards British Commonwealth or world approvals. Bush, Newlyn Way, Poole, England.

U.S. STAMPS. Giant discount catalogue, 25¢. Raymax, 37-VZ Maiden Lane, NYC 38.

ATTRACTIVE Set free Worldwide approvals. Goritz, Drawer 388PM, Park Ridge, Illinois.

STAMP Collecting outfit, includes worldwide stamps, nine triangles, two diamonds, new African Nations, Topical package hinges, millimeter-perforation gauge. Everything, 25¢ with approvals. Loraine Brown, Marion, Michigan 49665.

U.S. \$3 Stamps free! Columbus issue. Pony Express, Anarcie Territory, Beatles, Queen Elizabeth, Send 10¢ for approvals. Empire Stamp Corp., Dept. PM, Toronto, Canada.

QUEEN Elizabeth on stamps—A beautiful collection of 50 different stamps from 22 countries—all bearing the portrait of the Queen of England, 10¢ with approvals. Roseland Stamps, Spring Lake, 28, Michigan.

BEAUTIFUL Topical collection includes olympic sports stamps, wild animals, bi-color triangles, colorful birds, outer space stamps, 10¢ with approvals. Sunny Stamps, Fruitport 28, Michigan.

U.S. Canada price list 130 pages. 700 illustrations, stamp identification 10¢. Thom, 4808, 15th Avenue, Minneapolis, Minnesota 55417.

1¢ SALE. Genuine United States postage stamps, 100 different, \$1.00. Calvin Marcum, Hopkinsville, Kentucky.

100 DIFFERENT Turkey, 15¢! Packet approvals. Bargain price lists. United Schneider, Box 728C, Holland, Michigan 49424.

FREE Stamps, coin lists. Postage. Lewin, 8015 Grenfell, Kew Gardens 15, N.Y.

MAKE Attractive plaques from your extra stamps. Instructions, 30¢. Blank plaques and instructions, \$2.00. Vant Industries, Box 7124, Waco, Texas 76710.

FREE—Approval business money-making information! Stamp, 116-PH South Nevada, Colorado Springs, Colorado 80902.

U.S. Approvals. An introduction to a superior service. \$1.00 Buys = 230, 295, 398, 549, a collection of used blocks, 150 different commemoratives. Make your request today. Engle, Box 8, Lowell, Michigan 48331.

PRICE List. U.S. no approvals. Stamps. 5000 Miami, St. Louis 39, Mo.

CONFEDERATE States. 14 different facsimiles, 10¢. Stamp Collectors, Davidson, Henniker, New Hamp. 03242.

50 ATTRACTIVE Pictorials, 10¢. Interesting approvals. Alhambra, 6041 Columbus, Minneapolis 17, Minnesota.

KENNEDY Memorials issued by Yemen. Set of 3 giant-size stamps, beautifully colored; illustrations cover JFK and wife, as a youth, and on PT boat. Only 10¢ with Approvals. J. M. Palmer, P.O. Box 86-PMB, New York 34, N.Y.

WOW! 1000 Different worldwide—valued over \$20.00 only \$1.00 with quality approvals. Universal, Box 6, Kenosha 5, Wisconsin 53141.

TERRIFIC 1¢ & 2¢ approvals. Thousands available. Thoms' Stamps, P.O. Box 456PM, Richmond, Indiana 47374.

FLAGS. 1944 U.S. mint set. (13) only \$1.25. Goldie McLain, 203 VanBuren, Pueblo, Colo. 81005.

OLD Scarce U.S. seconds on approvals. Slight imperfections, lowest prices. Herndon, Box 316, Irvington, N.J. 07111.

CLEARANCE. Forty different packets only \$1.00. Norge Company, Ho-Ho-Kus, N.Y.

'CIRCUS.' Latest gigantic Hungary commemorative—Free! Plus 101 Bonus Sets, Approvals, William Deems, 226x Race, Ravenswood, West Virginia 26164.

CANADA Outdoor recreation complete. 10¢ approvals. Rheau, 6591 11th Ave., Montreal 36, Canada.

WHITE Ace cover stamp albums. Send for illustrated booklet, Washington Press, Mapewood, N.J.

100 FOREIGN 10¢ with beautiful worldwide approvals. Bill's, 67M, Kennebunk, Me. 04043.

220 DIFFERENT U.S. commemoratives. \$1.00. Rockefeller, 40 West Market, Red Hook, N.Y. 12571.

ONLY 50¢ for 75 diff. U.S. comm. Pittman. Box 125, Cottage Grove, Oregon.

110 DIFF. U.S. comm., \$1.00. Satisfaction guaranteed. Pittman, Box 125, Cottage Grove, Oregon.

UNITED STATES price list, 132 pages. price \$30. Mark Hanna, 335 Fifth Ave., Pittsburgh 22, Pa.

COINS, TOKENS, CURRENCY

FREE Coin supplies! Giant coin list 10¢ (refundable). Economy Sales, Mansfield, Massachusetts.

CIVIL War specials: 1863 cent, \$1.75; 1863 civil war token, \$1.75; 1864 genuine confederate states of America \$10.00 bill, \$1.00. Al Clark, 4300, Maroon, 31 North Clark, Chicago 40602.

HIGHEST Prices paid immediately for coins. Send 10¢ for 1966 buying prices. Wilmo's, 1067 F Bridge St., Grand Rapids 4, Mich.

10 DIFFERENT Indian cents. Bargain lists, \$2.25. Hobby Sales, St. Paul, Minnesota 55116.

10 DIFFERENT Indian cents. \$2.25. Hutchinson, Box T-6256, Philadelphia, Pennsylvania 19136.

1878-CC SILVER dollar. extra fine. \$4.95 postpaid. 1878-C, 1882-C, 1881-C, 1882-C, 1883-C, all five choice AU, \$9.95. Benze, 1122 Burbank Blvd., Burbank, Calif.

RARE Silver Dollars. 1879, 80, 81 8 mint \$3.00 ea. Uncirculated. New Catalogue, 50¢: Shultz, Salt Lake, Utah 84110.

25 BEAUTIFUL Coins from 25 countries. Mostly uncirculated. Terrific assortment. \$1.00. Hindley, Box 708, Aurora, Illinois. 60507

TWENTY Page 1986 retail price list of USA and Canadian coins 10¢. Our retail selling prices on thousands of coins and coin collectors supplies. Bryson Incorporated, 612A White, Toledo 5, Ohio.

COINS For collectors lists. 10¢. Mathis, Box 33, Limerick, Pa.

SILVER Dollar \$1.85; 2¢ copper \$2.00; 3¢ nickel \$2.25; large cent \$2.00; 1¢ dime \$2.25; All five \$9.95. Fairway 121-P, Rye, New York.

CLOSEOUTS! Terrific reductions! Indians! Lincolns! etc! List 15¢. Nelson, 346-P, Rye, New York.

LARGEST Coin magazine. 288 pages, 56¢. Scrapbook, 7330-J Milwaukee, Chicago 31.

FIVE different Liberty Nickels. \$1.00. Box 135, List free. Sayers, 1000 Unaka, Johnson City, Tennessee.

1955/5 LINCOLN Penny. poor man's double die, uncirculated, \$5.00. used, \$3.00. Brookline Coin, Dept. 3, Box G, Auburn, Massachusetts.

COINS Wanted! 96 pages of advertisements by major U.S. and Canadian dealers offering to buy coins. Special offer: Send \$1.00, receive 3 consecutive monthly issues. The Coin Buyer, 778 Bank St., Ottawa 1, Canada.

FOR Sale! 30 Lincoln cents before 1941, all different, \$2.00. Gene Carlton, Chandler, Okla. 74834.

"WORLD'S Safest Investment." New coins, 2500% profit, free details. George Shorpe, Dept. 9-PM, 9215 Chef Menteur Hwy., New Orleans, La. 70126.

PARAGUAY Coins. 3 different, 25¢. Jolie, Box 50F, Brooklyn, N.Y. 11224.

SAN FRANCISCO Roosevelt dimes, 8 different \$2.00. Set Canada pennies 1932 to 1964 \$2.00. Tirrell, Box 4469, Riverside, R.I. Free list.

\$1.00 SPECIALS! 4 Different Indian cents, \$1.00; 10 different Lincolns before 1921, \$1.00; 12 different mint marked Lincoln cents before 1941, \$1.00; 15 different '8' mint Lincolns, \$1.00; 4 different Liberty Nickels, \$1.00; 8 different Buffalo, \$1.00. New Morris Ent., Box 117, King of Prussia, Pa.

FIND Out what your coins are really worth! New 1966 coin guide, \$1.00. Fabona Coin, Box 7012PM, Kansas City, Mo. 64113.

LINCOLNS: 32 Different "S" including rare 1955S, \$1.60, 28 different before 1940, \$1.50, 16 different Brilliant Uncirculated, \$1.30. All three \$4.25. Harris, Box 1147F, Oceanside, California 92057.

NOW! Get 3 Real Old Lincoln Cents! Send 10¢ and receive 1919, 1920 and 1925. (Only one set to a customer.) Offer others on approval. Littleton Coin Co., Littleton T1, N.H.

THREE 1965-S XF Lincolns, \$1.00, 10 different V-nickels, \$2.95. Edel's, Carlyle, Ill. 62231.

30 DIFFERENT Worldwide coins. \$1.00. Newcomers, Box 91, North Quincy, Mass. 02171.

BEAUTIFUL Uncirculated \$1's—Daniel Boone \$13.75, Oregon Trail \$12.95, Pilgrim \$10.95, Stone Mountain \$7.95, Carver \$2.65, Washington \$2.65, Bermuda 1964 \$2.25, Canada 1965 Dollar \$2.25, Green Royal Wedding (New Monarchs) Crown \$2.95. Retail guidebooks: Redbook \$1.75, \$2.00. British \$1.00, British \$1.00, World Coins \$4.25. Gigantic bargain catalogue, \$1.00. Bebe's, Incorp, 4514 North 30th, Omaha, Nebraska 68111.

FOREIGN Silver, dollar size coins. Choice condition. Yemen 1963 \$5.00, Panama 1947 \$2.75, Bermuda 1964 \$2.25, Mexico 1959 \$3.25, Greece 1963 \$3.50. Other countries, McMahon, 2626 Westheimer, Houston, Texas 77066.

BARBER Half dollars, 3 different, \$2.95. Universal, Box 300, Richmond, Va. 23202.

"S" MINT Lincolns 25 different, \$2.50. 25¢. \$2.00. \$1.50. Postpaid, \$1.99. \$2.28. Fruitvale, Oakland, California 94602.

The Commemorative coins of Israel have tremendous potential and appeal. Write for your free price list. New England Coin Co., 806 Hippodrome Bldg., Cleveland, Ohio.

LINCOLNS: 30 different before 1941, \$2.00. Wiseman, Lenox Hill, Box 155, New York, N.Y. 10021.

5 ROLLS Unsorted buffalo nickels \$14.50. Postage \$1.00. Lists, 5¢. Ale, Jamesburg, N.J.

HOW To invest in coins for profit and safety. \$2.98. M. E. Hall, Rt. 2, Thermal, Calif. 92274.

40 PAGE Illustrated United States and Canadian coin list 10¢. Stoner, 280 Washington, Boston 8, Mass.

ANTIQUES, RELICS, INDIAN GOODS AND CURIOS

SELLING 20,000 Ancient arrowheads, spearheads, etc. List free. Lear's, Glenwood, Arkansas.

ARROWHEADS. 10¢ for \$3.00. List free. Hyde's, Box 1788, Santa Fe, New Mexico.

ALLIGATOR—Gar arrowheads. Florida. Rare in collections. Ten, \$1.00. Flint arrowhead mining secret, ancient illustrated methods. Guaranteed, \$1.00. Circulars, 25¢. Blackhawk, Umatilla 16, Oregon.

HIGHLY Decorated Indian drum, tomahawk, 6 ft. whip, blow gun with darts, ceremonial dance bells on woollens with dance lessons, Indian headdress, \$2.00 each or all 6 for \$10.00. Handmade by the Cherokee Indians. Very colorful—Free gift with \$10.00 order. Cherokee Krafts, 713 Valle Vista Drive, Dept. PM, Asheville, N.C.

TONS Of antique gun parts and supplies. All reproduction muzzle loading guns. Send \$1.00 for enlarged illustrated catalog No. 115. Dixie Gun Works, Union City 12, Tennessee.

MODELS—SHIPS, TRAINS, PLANES, ETC.

BUILDING Materials, 1/4" & 1/8" scale, windows, doors, siding, roofing, lumber and structural steel materials. Pictured catalog with samples. Small Sales Co., 6025 Martway, Mission, Kansas 66202.

ROCKETS: New illustrated catalog 25¢. Single and multistage kits, cones, engines, launchers, trackers, technical information, etc. Fast service. Estes Industries, Penrose 2, Colorado.

SHIP Model kits and fittings: clippers, frigates, etc. Catalog paint-tool list, book list, 35¢. Model Shipways, Box 85, Bogota, N.J.

LIVE Steam and gasoline model engine kits from \$8.20. Boilers, accessories. Robust, new design materials. Pictured catalog, 50¢. HP Models, Box 34, Centuck Station R, Yonkers, New York.

SHIP and yacht model fittings: Pine construction hull kits; blueprints. Send 50¢ for illustrated catalog. A. J. Fisher, Inc., 1002 Elbow Avenue, Royal Oak, Michigan 48067.

SHIP Models. Kits, fittings, plans, books, tools, engines, motors. Big illustrated catalog 50¢. James Bliss & Co., Route 128, Dedham, Mass. 02026.

STEAM Engines for operating toys and models. Free catalog. O'Connor, Box 715, Baker, Oregon.

COLLECTORS Tanks and vehicles. Catalog, 10¢. Frontier Hobby, Box 1133F, Covina, Calif.

HARD-To-find tools for modelers, craftsmen. Catalog, 10¢. Brookstone, Worthington 5, Massachusetts.

STUART Steam engine castings, boilers, castings machined. Catalog 50¢. Carolus Model Engineering, 1131 Wilson Ave., Salt Lake City, Utah.

HOBBYISTS Electroplating kit, \$3.95 Postpaid. Details. Miniplating, Box 115, Mansfield, Mass.

COMPLETE Line: Stationary, marine, Corliss tractor, locomotives, live steam engine castings, tools, tools accessories for building. Some machined, finished. 100 page catalog, \$1.00. Cole's Power Models, Ventura, Calif.

STEAM Engines, castings and finished Stuart Creators & Co. Compound fittings, tools, boilers, pumps. Catalogue \$1.00. Denison Live Steam Models, Box 306 S. Darlington, Pa. 16115.

GAMES, TOYS, NOVELTIES

FREE Sample, fortune teller miracle fish. Rush 10¢ for 32 page catalog, newest and best novelties. Dohn-6K-Marks, Broadview, Illinois.

ROYALTIES For original toys. games. Tempo, Box 35, Woodbury, N.Y.

GAMES Inventors! We are interested in new and novel child and adult game ideas. Nationally-known game manufacturing and marketing firm. Send for details. Haggard and Associates Research, Dept. A, 650 Ottawa Ave. N., Minneapolis 22, Minnesota.

MAGIC TRICKS, PUZZLES, JOKER NOVELTIES

VENTRILOQUISM! Information Free! Dummy Catalog 25¢. State age. Maher, Box PM-11, Kensington Station, Detroit 24, Michigan.

FUN 'N' Magic catalog, 10¢. 1,500,000 tricks, jokes, novelties, puzzles, disguises, books. Elbee 7408-P, San Antonio, Texas 78207.

NEW Edition, 1965 catalog, 50¢ tricks, only 10¢. Fastest same-day service to magicians for 40 years. Send 10¢ today. Douglas Magicland, Dept. 21, Dallas, Tex.

COMPLETELY Illustrated catalog, 8¢ pages, 25¢. Manhattan Magic, Box 334-M, N.Y.C. 11.

MAGIC Catalog! World's finest, 3000 tricks (408 pages) \$2.50. Beginners amateurs, professionals. Kander's, A-200 South 13th St., Philadelphia, Pa. 19107.

LATEST Giant surprise catalog! 1000 Professional tricks, magic, jokes! Exciting! Thrilling! Only 10¢. Vick Lawton's Magic, Dept. PM65, 4018 N.E. Fifth Ave., Ft. Lauderdale, Florida.

BAFFLING Card trick 10¢ with bargain magic lists. Wishart, 3105 West Broad, Columbus, Ohio 43204.

BE A magician! Two booklets explaining sixty-eight tricks plus large professional catalog \$1.00. Magic, Inc., 5082 Lincoln, Chicago, Illinois 60625.

VENTRILOQUISM For fun or money, new method, easy. R. Marlette, 554 Lynn Ct. Apt. A, Glendale Hgts., Ill.

WORLD'S Finest professional magic tricks, Joker's Novelties, Giant illustrated catalog 10¢. Top Hat, Evanston, Illinois.

BOOKS, PERIODICALS

OUT-Of-print books at lowest prices! You name it, we find it! Fast service. No charge. International Bookfinders, Box 3005-PM, Beverly Hills, Calif.

FREE Catalog, Self-help books. Write Wishner, 8721 Sunset, Los Angeles 69P.

BOOKS Successfully located! Atlantic Book Service, Cedar Street, Charleston 29, Mass.

PROPHET Elijah coming before Christ. Wonderful book free. E. Megiddo Mission, Rochester, New York 14619.

BOOKFINDERS! All subjects. Send wants! Sydney Jaser, 175-45 88 Ave., Jamaica, N.Y. 11432.

BOOKLOVERS. Seekers, only 25¢, featuring autobiographical diaries, art, letters. Ivory Tower Journal, 444-M, Fort Lee, N.J. 07024.

FREE Booksearch. Send wants. A-to-Z Book Service, Box 535, Staten Island, N.Y. 10302.

SAVE TO 84% on books. Free Catalogue. Discount Reader's Service, M-5438 Upland Way, Philadelphia 19131.

CHALLENGING! Different! Unusual books! Free catalog. Ruby's, D-26, Paradise, Pennsylvania 17682.

FREE Catalog unusual books. Murry Company, Dept. 365, 3000 Truman, Kansas City, Mo. 64127.

BALDNESS: Is it necessary? A book on nutritional approach to loss of hair. \$4.00PP. Baldness, H-2917 West Grace, Richmond, Virginia 23230.

FREE Catalog Self-help books. McConnell's, 37 Center, New Haven, Conn. 06510.

BOOKS Located! All Subjects. Send Wants! Schaffers Books, Box 43B, Fenton, Michigan 48430.

35¢ ONLY! Webster's new pocket dictionary. Free catalog, Paul's Company, Box 2691, London, Ontario, Canada.

BOOKS. Free general catalog, 100 pages. Text, vocational, educational, instructional subjects. Millions of volumes, new and used. Bargain prices. Books bought, Est. 1962. Long's College Book Co., Dept. PM, Columbus 1, Ohio.

PLAYS, STORIES, MANUSCRIPTS

WANTED Writers! Short stories, articles, books, plays, poetry. Will help place sell your work. Write today, free particulars! Literary Agent Mead, Dept. 20A, 915 Broadway, New York 10, N.Y.

WANT Your book published? Learn how we publish, advertise, promote, distribute. Many successes. Free booklet, PM, Vantage, 120 West 31, New York City.

BUSINESS OPPORTUNITIES

OPERATE Home mailorder business. Voseack Printing, 4444AI Ute, San Diego, 17, Calif.

RAISE Rabbits on \$500 month plan. Free details. White's Rabbitry, Mt. Vernon, Ohio.

HUGE Profits! Mail order importing. Free information. ITIS-PM-11, Box 454, Hollywood, Calif. 90028.

DOLLS! Dolls! Dolls! We teach you to make, repair, dress and sell. Study at home. Earn while learning. Free booklet. Doll Hospital School Studio MC-115, 11826 San Vicente Blvd., Los Angeles 49, Calif.

LEARN Landscaping and the growing of plants. Start a profitable business part or full time. Free information without obligation. Lilliane C. Coer School, Dept. MC-115, 11826 San Vicente Blvd., Los Angeles, Calif. 90049.

SPARE Time earnings. With your table-saw, bandsaw or jig-saw. Write: Workshop, A3800 Harney, Vancouver, Washington 98660.

SELL Advertising book matches. Write us today: We put you in business by return mail, handling complete line ad book matches in demand by every business right in your town! No investment, everything furnished free! Top commissions daily! Superior Match, Dept. MX-1165, 7530 S. Greenwood, Chicago 19, Ill.

SIMPLE. Pleasant, mailorder can net \$12,000 a year. Write Rutward, 2610 Bryant, Columbia Station, Ohio.

TO \$100.00 weekly! Mailing catalogs! Sample instructions. 25¢. Costar, OPO Box 972-PM, New York 10001.

BAKE New greaseless doughnuts in kitchen. Stores buy output. Start spare time. Profit 29¢ dozen. Small appliance. Free recipes. Montgomery, 3905 South 15th, Minneapolis 7, Minnesota.

FREE "Franchise Profit Letter" tells how unique NFR service is helping thousands seeking profitable businesses. Write today. National Franchise Reports, W-528, 333 North Michigan, Chicago 1.

SECRETS! Secrets! Mail order success revealed by internationally famous expert. Discover how to make home business fortunes. Beginner. Get free copy "How to Make Money in Mail Order." Discloses free advertising, profitable products, everything! No obligation. Write Malico, 1554 Sepulveda, Dept. P-70B, Los Angeles 25.

PACKAGE At home for profit! We supply everything. No "selling." Free home business details. HPC 807HPE, Sunset, Los Angeles 12.

FREE Facts and descriptive bulletin. Be an air conditioning, refrigeration, and heating serviceman. High pay, jobs open everywhere, operate your own service business. No capital or experience necessary. Write Doolco, Trouble Shooter, 2016 Canton, Dallas, Texas.

\$70.00 WEEKLY—home, spare time. Simplified mail bookkeeping. Immediate income, easy. Auditax, 34741s, Los Angeles 90034.

MAKE \$46 From square foot plywood: jig-saw necessary. Free details. Woodart, Bridgewater, Mass.

EARN Money raising fishworms for use! Write: Oakhaven-38, Cedar Hills, Texas.

IMPORT-Export opportunity, profitable world-wide, mailorder business from home, without capital, or travel abroad. We ship proven plan, for no risk examination. Experience unnecessary. Free details. Mel-linger, P70B, Los Angeles 90025.

MAKE \$32 From 49¢ piece vinyl. PMA-1834 Edgeland, Louisville, Ky. 40204.

PIANO Tuning learned quickly at home. Tremendous field! Musical knowledge unnecessary. Information free. Empire School of Piano Tuning, Box 327, Shenandoah Station, Miami, Florida 33148. (Founded 1935).

400,000 BARGAINS below wholesale! Many free. Liquidations, job lots, single samples. Free details. Bargainhunters Opportunities, Box 730-A, Holland, Michigan.

MAKE Money from old tires. Operators clearing \$400 weekly. Equipment costs \$800. Get facts. J & S Patents, Inc., 3511 N. Lincoln, Chicago 13.

READ Progressive Mailtrade, the magazine that tells how to make money by mail. Quarter brings sample and special offer. Mailtrade, P.O. Box 357, Sheboygan, Wis. 53082.

\$60.00 DAY. Manufacturing concrete posts. Call area 183 Fremont, Rapid City, South Dakota 57704.

BUY Appliances, cameras, watches, etc. at factory prices plus 10%. Free details! Cam Company, 436-13 Bloomfield Ave., Verona, N.J. 07044.

COPUBLISH "Mail Sale Advertiser," leading mailorder paper. Copy and details 28¢. Vanvor Shirk, Lebanon, Pa. 17042.

MAILORDER Catalogs. No inventory required. Discounts 40% up, postpaid. Send 25¢ for 32 page sample catalog, featuring 150 unusual, fast-moving products and complete details. Satisfaction guaranteed. Gaylords, North Adams 7, Mass.

BIG Money raising fishworms and crickets. Free literature. Carter Farms, Plains, Georgia.

CONCRETE Fats: Cement artists make big money. Previous experience unnecessary. Home shop, simple equipment, copy-righted methods and formulas. Make color and marbled glass beautiful cement pottery without molds. Washing wells, bird baths, waterfalls, rustic garden and patio items. Free illustrated brochure. Hollywood Cementcraft, 602 Athens Street, Altadena, California 91001.

\$400.00 MONTHLY Raising giant fishworms. Soilless method. Charlie Morgan, Bushnell, Florida.

COLORGLAZED Concrete pottery made without molds. Patented method. Cemetery products, novelties, tiles. Basement leak-sealing. Money-making projects. Booklet, details free. Men only. National Potteries Company, Grand Rapids, Minnesota.

INVESTIGATE Fires, storm damage, accidents for insurance companies, pays up to \$1,000 a month, part or full time. No college necessary. Car furnished; expenses paid. We train you at home in spare time. Keep present job until ready to switch. Pick your location. Men badly needed now. Full information free. Write Liberty School, Dept. C-518, 1139 W. Park, Libertyville, Illinois.

MEN—Women. Everybody likes fine candy. Make professionally home. (Our first year) Ragdale Candies, B107, East Orange, New Jersey.

PROFITABLE Catalog Mailorder Business! Vikari's, 835-PM, First Avenue, Salt Lake City, Utah 84103.

START Your own business on credit. Your own boss. Hundreds of dealers making \$100 to \$300 and more weekly. We supply stock equipment on credit, 30¢ home necessities. Sales experience unnecessary. Pleasant, profitable business backed by world-wide industry. Write Rawleigh, Dept. K-U-PPM, Freeport, Ill.

WORLD'S Largest wholesale supply. Buy from 7853 American, European, Japanese wholesalers. Tailormade suits from Hongkong, 123 dropship catalogs. Rock-bottom prices. Free details. International Buyers, 216-MM Jackson, Chicago 6, Ill.

OPERATE Home mailorder business. Eldee Printing, 111-B Cumberland, Lawrence, N. Y.

BOOKKEEPING System. Substantial profit selling Start Service, Kern, Box 263, North Hollywood, California.

PLASTERCAST Molds, liquid rubber, plasters, rocks, candle supplies. Catalogs and manual free. Blue Rapids Supply, Blue Rapids, Kansas.

MAILORDER Book publisher wants dealers. Wholesale price-list free. Neil H. Tasker, Shamokin, Pennsylvania.

I MADE \$40,000.00 year by mailorder! Helped others make money! Start with \$10.00-Free proof. Torrey, Box 3566-Y, Oklahoma City, Oklahoma 73106.

FREE Book "990 Successful, Little-Known Businesses." Work home! Plymouth-672K, Brooklyn, New York 11218.

WANT To make big money at home? \$10.00 profit in an hour possible with invisible mending. Make tears, holes disappear from clothing. Free home-based year-round demand from cleaners, laundries, homes. Details free. Fabricon, 1585 Howard, Chicago 26, Ill.

NET \$12,000 yearly through mail order. Free reveals how. Details free. Laurina, 1137 Second Avenue North, Jacksonville Beach, Florida 32250.

SELL Champion, AC, Autolite spark plugs. Reconditioned, electroplated, guaranteed 10,000 miles. 100% profit. Free sample. Lee Plugs, 1908-A Roberts, Houston 1, Texas.

BUILD Custom cases at home for profit. Get orders by mail. We supply materials, instructions, everything. Free home business details. Customcase, 805CPE, Sunset, Los Angeles 12.

FREE Booklet! Profitable, spare-time business brokering. PearlKotting baby shoes! Complete set-up on credit. Kikivai, Box 34861-B, Los Angeles, California 90034.

SELL Information by mail. Amazing profits. All-revealing manual. \$2.00. Saxe, Milan, Ohio 44846.

YOUR Own home business, interesting, profitable, different. Details free. Richey, 441 East Main, Greenville, Ohio 45331.

IMPORT-Export business made easy. Complete setup service. Not just instructions. Hermes, 152 West 42, New York City 10036.

OPERATE Proven, profitable, mailorder program #4. Professional methods. Free program! Mail Sales, 520 Fifth Avenue, New York, N.Y. 10036.

HAWAIIAN Jewelry sells fast because it is new and exciting. Details free. Chandlers, Wailuku, Hawaii, Dept. 3115.

MONEY In your mailbox. Save time, money, disappointments. Informative manual, 25¢ refundable. Modern Methods, Box 1203, Boulevard 1, California.

EXTRA Money making plastic signs at home. Free details. Napco, Box 33485-P, Los Angeles, Calif. 90023.

ADDRESSERS And mailers needed. Send stamp for information. Lindbloom, 1508 West Erie, Chicago, 60622.

MAILORDER Laws, \$2.00. Kalvin Kahn, Attorney, 4504-N Pine, Philadelphia, Pa.

R. H. CALAWAY Son, P.O. Box 1141, Ft. Smith, Ark. 72902. Extra profit income in a business of your own. Details free.

VENDING Machines: 1, 5, 10 and 25¢ vendors, merchandise novelties, parts, supplies and service. Write for catalogue. Vending Dist. Co., 1800 North Mifflin Co. 24140 Detroit Road, Westlake, Ohio 44091.

VENDING Machines. No selling. Operate a route of coin machines and earn amazing profits. 32-page catalogue free. Parkway Machine Corporation, 715 PMB Ensor Street, Baltimore 2, Maryland.

NEW Products sources galore in new products newsletter. Write: Mampio, 1507 Barry, Chicago, 60637.

MAILORDER-Mail your own baby catalogue. Big profit. Orvis, 5115 Willard Road, Peoria Heights, Illinois 61614.

MAIL Order opportunity offers. Big mail, 35¢ handling and postage. Mundy, 440 W. 34th, New York, N.Y. 10001.

50 YEAR Old tool, die and special machine company with AAA rating wants to manufacture product line. Will tool and automate if required. Barth Mfg. Co. 24140 Detroit Road, Westlake, Ohio 44091.

SELL Books by mail. 400% profit. Royal, Box 450-X, Cleveland, Ohio 44127.

BIG Profit installing automatic garage doors! Free details. Maryland Electrosystems, Bowie, Maryland.

"FLOCKON" New profitable way to beautify anything. Put a velvet or Suede trim on automobile interior, signs, toys, lamps, 1001 uses. For business or pleasure. Special introductory offer only \$20.00 for materials and complete instructions. Satisfaction guaranteed. United Flockon Company, Box 1614, Annex Station, Providence, Rhode Island 02901.

\$25-\$100.00 WEEKLY possible. Addressing envelopes. Compiling names (Long-hand-typewriter). Details free. Superior, Box 721-A, Elton, Maryland 21221.

REPAIR Sewing machines. Easy. Profitable. Complete instructions \$2.25. Free literature. Lincoln, Box 52, Hempstead, New York 11551.

INSTALL Burglar alarms without previous experience or costly equipment. Big profit. Free details. Nasco, 11071 Massachusetts, Dept. FT0B, Los Angeles 90023.

EARN Big Money! Learn electric appliance repairing at home in your spare time. How to use Christy Electronic Trouble Tracer to make repairs. Make \$5-6 per hour in kitchen or basement. Pay later. Send \$2.00 to Christy Trade School, 3214 W. Lawrence, Dept. AT063, Chicago 60625.

MAILORDER. No Stock Investment. Over 500 American Drop-shop Sources. Directory—\$2.00 Value Home, 550-M Fifth Avenue, N.Y.C. 10036.

MAKE Fast selling children's item from scratch. Details free. Clifford Richards, Rt. 1, Huron, Ohio.

COFFEE Save device brews 120 cups per lb. any grind. Less cleaning, and boil over mess. \$2.95 per unit. Franchises available. Marko Dist., 6051-44th St. N.E., Minneapolis 21, Minn.

PROFITABLE Home business practical! Free! Practical Publications, Box 187-A2, Newark, Ohio 43055.

PAINT Murals for profit. Earn \$10-\$15 per hour. No art experience needed. New transfer method. Paint \$100 mural for \$20.00 in paint. Home cameras, bars, builders, homes, etc. Free Success Plan. Murals, Box 883-BE, Tarzana, Calif. 91356.

FANTASTIC Opportunity! Model Raceway franchise returns among sales' fastest profits on capital invested in entire U.S.A.! Full franchise details, and purchase of finest tracks made in America, by Model Raceways, 872-P Mass. Avenue, Cambridge, Mass.

FREE! 128 Page illustrated catalogue. More than 2000 name Brand items; below wholesale prices. Sell full or part time. Save hundreds of dollars on purchases for youth, jewelry, cameras, radios, phonographs, tape recorders, appliances, housewares, cookware, hardware, party tools, luggage, musical instruments, sporting goods, toys, many others. Floors of Name Brands. Orders shipped within 24 hours. Continuous supply. Send for free catalog now! T. B. Davis Corp. Dept. PM, 145 West 15th Street, New York, N.Y. 10011.

YOUR Employment agency! Earn \$25,000 and up last year. Why pay franchise fees or buy a shop? Never a failure. For free details of exclusive low cost school, write Chambers Employment Agency School, 6th floor, Bennett Bldg., Council Bluffs, Iowa.

FREE Report: "609 Unusual, Successful Business!" Box 51-PN, Des Plaines, Illinois.

BUY Wigs wholesale, sell retail. Queens, Box 95B, Jamaica, N.Y. 11417.

HOW To get capital, loans, grants, cash to start a business. Free details. National Counselor, Harington 17, Texas.

NEW, Easy and amazingly profitable business of your own manufacturing enormous variety sculpture sports equipment. Minimum investment, prompt returns, unlimited potential. Details free. Bob Wade Associates, P.O. Box 8645, Nashville, Tenn.

START Profitable mail order. Easy in business. Free literature. 12-96 Pass, 3511 Hudson Parkway, New York, 10463.

FRANCHISE: Cold water dye compound used in rug scrubbing machine. Covers all stains including dog stains. Information: The Chem-Dyne Company, P.O. Box 723 N. Main, Riverdale, California 92501.

TELEPHONE Your way to money. Opportunities unlimited. Edwards, Room 5M, VFW Bldg., Kansas City, Mo.

FREE Report! "Cash Mailorder Business." Rein, Box 559B, Freeport, New York 11520.

RADIO Mail order, \$50,000 in one month possible. No cost percentage plan. Walthay, Box 53-M-3, Los Angeles 90032.

MAIL Multi-colored catalogs printed with your address for big profits! Details. Sample 25¢ (refundable). Specialties, Box 148, Ypsilanti, Michigan 48197.

SAWDUST. Tin-cans. Newspapers. 200 uses. Instructions. \$1.00. Charles Company, 42-GPT, Norwood, Ohio.

MAKE money running your own restaurant. Information free. Write Dept. PM-1-R, Restaurant Management Institute, 3854 N. Sawyer, Chicago, Ill. 60618.

EARN Money at home in spare time repairing all appliances, do housewiring, motor rewinding, electrical maintenance. We show you how, send trouble shooting instruments, business getting materials, etc. Write for free book. Pay later plan. Advance Trades School, Dept. E-103, 5944 Newark, Chicago 60631.

OPERATE Your own big paying small business. Details free. Write Dept. PM-1-Waverly, Palo Alto, Calif.

FREE valuable franchise-distributor reports. 15¢ handling. Livingston Consultants, Shadyside, Maryland.

ARNOLD Palmer offers you unequalled opportunity to profit from tremendous popularity of golf and power of Palmer. Highly profitable! Exclusive rights in Golf Franchise available. Complete national program. Heavy profits—minimum investment. Write for details. Arnold Palmer Enterprises, Dept. CR, Pleasantville, New Jersey. Tel. 609-646-3500.

NEW Free Franchise Plan offers 200%-1000% profit! Candle-crafting—a multi-million dollar field—offers men, women, families opportunity to start own spare-time home business on shoestring. Free BIG Start earning almost at once, high as \$5.00 hour, year round demand. Custom candles sell for \$2.00-\$3.00 each—materials cost pennies! Big companies can't compete. Send for Free Franchise Plan and facts on home instruction and how we start you in business. Candle Inc., Box 100, Del Mar, San Diego, California.

NO Stock—imprints—mailing. Keep 90¢ each \$1.00 run ads. We mail & drop ship. Details. 10¢. Campers, Grove, Oklahoma 74344.

MAKE Money in electronics radio-TV. Unique RTS training program. No experience needed. 14 hr training kit included. Learn in spare time. Prepare for better salary, better job, or your own business. Free catalog and information: RTS, Dept. 60099, 815 East Roscrans, Los Angeles 90099.

IMPORTING Made easy. 100,000 foreign suppliers guaranteed. Details free. Book \$2.00. Tacmar, Box 118M, Tiverton, R.I.

SELL Uncle Sam! Depression proof home business buying Old Gold. Successful plan shows how. Details free. Patton, Dept. PM-115, Box 253, Arlington Heights, Illinois.

MANY Earn \$1500.00 per month operating collection agency. Free details. Franklin Credit, Roanoke, Virginia 24004.

LIQUID Molding rubber, free information. Chaney's, 5415-A San Jose Blvd., Jacksonville 7, Fla.

MONEYMAKING OPPORTUNITIES

EARN Money evenings, copying and duplicating comic cartoons for advertisers. Advertise. Argyle-1, Wisconsin.

CIGARETTES. Make 20 plain or filter tip for 9¢. Factory-fresh pipe tobaccos. Mild tropical flavored Philippine cigars. Facts in. Moberly, Box 894, Owensboro, Kentucky.

SELL Titania gems: more brilliant than diamonds. Catalog 10¢. Diamonite, 2420-G 77th, Oakland 5, California.

EARN \$240.00 a month at home, spare time, doing only two \$5.00 invisible mending jobs. Free literature. Write for details. The makes cut, tears disappear from fabrics. Steady demand. Details free. Fabricon, 1532 Howard, Chicago 26, Ill.

MINK Raising information free. Lake Superior Mink Farm Inc., Superior, EEL, Wisconsin.

BIG Money raising hairworms and crickets. Free literature. Carter Hatchery, Plains, Georgia.

NEW Instant invisible mending. Learn in one hour, repair in five minutes. Make \$150.00 week. Literature free. The Henson Company, P.O. Box 6136-6, Philadelphia, Pa. 19115.

HOT Money making line! Show line of business printing, advertising specialties, calendars. Watch orders pour in. All repeat items. Terrific commissions in full or spare time. No experience, no investment. Cash discounts to customers. Free bonus gifts to you. Free sales kits. Willens-David Local Press, Dept. W-27, Waukegan, Illinois.

AMAZING Successes through franchises! Become exclusive franchise holder your territory. Information rushed. National Franchise Reports, WP-528, 333 North Michigan, Chicago 1.

MAKE Plastic novelties for extra income. Low cost home training now available. Write for free booklet. Interstate Training Service, Dept. D-3, Portland 12, Oregon.

WORK Home, part-time, mailing our catalogs! Free details! Cam Company, Dept. 53, Verona, N.J. 07044.

EARN Big commissions full or part time. Show America's largest line low priced business printing and advertising specialties. Calendars in season. Big free sales kit samples hundreds items used daily by business people. Build profitable repeat business. Start right now. National Press, Dept. 19, North Chicago, Illinois.

EASY To start rubber stamp business at home in spare time. Make up to \$9 an hour without experience. Facts free. Write Roberts, 1512 Jarvis, Room CR-2-LW, Chicago 26.

MEN - Women! Start money-making plastic laminating business at home in spare time. Material that costs 1¢ brings \$2.59. No canvassing or selling but mail orders bring in \$20 a day. Write for full particulars free. Rush name on postcard to Warner, Room CL-2-LW, 1512 Jarvis, Chicago 26, Ill.

MAKE Money reading your newspaper! LIU-PM2, Box 4759, Chicago 60680.

SHARP \$553 Opportunity! One low-cost machine sharpens - serrates knives, scissors, pinkies shears. Earn \$6-9 hourly in spare time. Professional results without experience. Free details. Beaver Machine, Box 121, Gardena, California.

MAKE Money! Writing short paragraphs! No tedious study! I tell you what to write and how to sell, and supply list of editors buying from beginners. Many small checks add up quickly. Write to sell, right away. Send for free facts. Benson Barrett, Dept. C-27-1A, 6216 No. Clark, Chicago 26.

RAISE Rabbits and fishworms on \$500 month plan. Free details. White's Rabbitry, Mt. Vernon, Ohio.

CLIP Items from daily newspapers. Get \$1.00 to \$5.00 each. Details free. Walter, Box 1023-P, Erie, Penna.

EARN Thousands yearly, selling books by mail! Romain House, 1810-PM, Romain, Columbia, South Carolina 29210.

FABULOUS Profits raising fishworms. Good steady income. Write for details. Exello, Kosciuszko, Mississippi 39090.

FREE Literature! Planned profits, all ages. Postal agency: Aladdin Research, Box 5183-K, Oakland, California 94605.

BIG Profits selling books by mail. No inventory necessary. Free details. Laurins, 137 Second Avenue North, Jacksonville Beach, Florida 32050.

CASH In on prize contests. Learn how. \$1.00. Laurins, 137 Second Avenue North, Jacksonville Beach, Florida 32050.

FABULOUS Opportunity for women, any age. Earn \$25 day or more as beauty advisor. No experience. Get details, sample \$2. Good steady income. Write for details. OP-351, N. Hollywood, California.

WIN Cold cash! Prizewinner sizzles with terrific contests, torrid tips, impertinence! Free sample! Box 11569, St. Petersburg, Fla.

AMAZING Money making plans. Part-time, home, no experience. C.I.D. 1363 Fisher, North Bay, Ontario.

BECOME A Notary Public! Win extra income, prestige, business contacts. Details free. Stationers Exchange, P.O. Box 617, Kilgore, Texas 75662.

202 FIRMS Begging for homeworkers! Instructions \$1.00 postpaid. Carter Company, La-Plaza Acres, Searcy, Ark.

"NEW BOOKS" 80 ways to make extra money by mail. Lee, Box 253-P, Goleta, California.

LEARN The secrets of repairing junk batteries. "Fabulous Profits" at home. Details. The Batterman, P.O. Box 416, Palm Desert, Calif.

MAKE Money with coins, operate by mail from home. Informative pamphlet. \$1. J. Taylor, 3516 Kensington, Evansville, Indiana.

PROMOTING Your Ideas. Production-management courses, valuable list, mail order instruction, handling without patent. We sold 70,000 our creation. Details free. Stephen Walsh, 690A Joann Street, Costa Mesa, California 92627.

TYPISTS! Typists! Typists! Work home. Steady income. Hamilton, Box 4, Astoria 3, N.Y.

BEST Quality German watches, wholesale. Shade, Box 96, Coatesville, Penna. 19320.

80 WAYS To make money by mail, \$1.00. Box 14368, Okla. City, Okla.

ARTISTIC Interiors cast tile, brick, stone, plaques, changeable letter signs. Wholesale catalog Duchesne, 1005 First Ave., Des Plaines, Ill. 60016.

START Your own home mailorder business, sparetime! Easy; fascinating; profitable! Alfano, 19-PM, Pine, Closter, New Jersey 07624.

MEN - Women! Sparetime opportunity. Secretarial homework. Refundable instructions, \$1.00. Interstate, 37 Besch, Albany, New York 12209.

HAVE Your own good paying, money-making business! Full, sparetime. Particulars for Adams, Box 62-PM, Elmhurst, New York 11373.

DOLLAR Ad service. "\$200 week plan." Work home. Free details. Ad Market, Hargensen 4, Texas.

\$200.00 FROM Sheet of plywood, 25¢ refundable. Novelties, 610 So. 24th, Elwood, Indiana.

New Device every eyeglass wearer needs. Tremendous profits. Start your own mail order business. \$1 refundable with first order, brings your dealership kit. Linco, Main P.O. Box 96, Yonkers 20, New York.

BOOKKEEPERS Operate bookkeeping tax service. Universal, Box 664-M, Springfield, Missouri.

SEASHells, Shellcraft and jewelry supplies. Wholesale catalog 25¢ refunded first order. Our 31st year. Florida Supply House, Box 847M, Bradenton, Fla.

YOU Can become foreman; superintendent or general manager where you work; make more money! Booklet, \$1.00. Hodge, Clermont, Florida 32711.

EXCLUSIVE TV page guide. Build profitable mail order business. Buchalter Sales, 834-175th St., Dept. 12, Hammond, Indiana 46324.

TYPISTS! Homeworkers! Make money at home! Mailers, 2 Madison, Greencastle, Indiana.

BOOKS, Folios, for homeworkers, hobbyists. Write for details. Ralph Underhill, Beebe, Arkansas 72012.

PLASTERCRAFT Items costing pennies sell for dollars. Details, \$1.00. Leitch Studio, 3617 N. Broad St., Phila. 19140.

"TYPING FOR PROFIT!" Instruction manual. \$1.00. Satisfaction guaranteed. E-Liu Company, Box 4759, Chicago 60680.

MOBILE Home roof coatings. Guaranteed not to leak. Dealers needed. Alumnum Industries, Dept. PG-115, Kansas City 11, Missouri.

GUARANTEED Buyer! - We need common American coins for Canadian collectors. Hundreds wanted! - Every cent before we start! Kit - Numismatic Associates, Suite 227, 1235 University, Montreal 2, Canada.

VENDING Machines. No selling. Operate a route of coin machines and earn amazing profits. 32-page catalogue free. Parkway Machine Corporation, 715 PMP Ennsor Street, Baltimore 2, Maryland.

START A profitable subscription business in spare time! We need men and women (young and old) as representatives for all leading national magazines. Liberal commissions on all subscriptions. Supplies free. No experience needed. Send this ad with your name and address to: Popular Mechanics, Room 11-O, 250 W. 55th St., New York 10, N.Y.

PROFITABLE OCCUPATIONS

EARN \$240.00 A month at home, spare time, doing only two \$5.00 invisible mending jobs a day. Big money paid for service that makes cuts, tears disappear from fabrics. Steady demand. Details free. Fabricron, 1586 Howard, Chicago 26, Ill.

AUCTIONEERING - Resident and home study courses. Auction School, Ft. Smith, Ark.

VENDING Machines. No selling. Operate a route of coin machines and earn amazing profits. 32-page catalogue free. Parkway Machine Corporation, 715 PMP Ennsor Street, Baltimore 2, Maryland.

INVESTIGATE Accidents. Earn \$750 to \$1,400 monthly. Car furnished. Expenses paid. No selling. No college education necessary. Pick own job location. Investigate full time. Or earn \$8.44 hour spare time. Men urgently needed now. Write for Free Literature - No obligation. Universal, CPM-11, 6801 Hillcrest, Dallas 5, Texas.

BECOME Independent with your own franchise business. Thousands earning handsome incomes. Request interesting facts today. National Franchise Reports, PM-528, 333 North Michigan, Chicago 1.

MAKE Money writing short paragraphs. Information free. Barrett, Dept. C-27-1B, 6216 N. Clark, Chicago 26.

CHROME Plating, instructions, equipment and supplies. Platers Supply, P.O. Box 565, Lugo Station, Los Angeles, Calif.

SHARPEN Scissors, pinkies. Inexpensive equipment, tools, supplies. Blackhawk's, Sheidahl, Iowa.

FREE Book "990 Successful, Little-Known Businesses." Work home! Plymouth-87K, Brooklyn, New York 11218.

POLAROID Camera owners! Earn immediate cash! Instructions, 25¢. Barcton, 405-PM South Second Street, Alhambra, California 91802.

YOUR Own sign shop - Signs, 1017 W. Mulberry, Springfield, Ohio.

BAKE New greaseless doughnuts in kitchen. Sell stores. Free recipes. Michael, 3605 South 18th, Minneapolis 17, Minn.

BIG Money raising fishworms and crickets. Free literature. Carter Wormery, Plains, Georgia.

BECOME A mortgage broker earn \$10,000 year up. Details. United, Box 6284-P, Marietta, Georgia.

BIG Profits, manufacturing bookends, plaques, statuary. Easy home business. Plastex, Box 3051, Denver 18, Colorado.

JANITORS - Custodians - cleaners make more money. Get a better job. Become a maintenance supervisor. Free home study information: Maintenance Training, 511-12th Niagara Falls, N.Y.

START A magazine subscription business. Earn generous commissions on Popular Mechanics, Good Housekeeping and all others. Best commissions, bonus, all material sent free. No experience needed. Write Popular Mechanics, Room 11-P, 250 West 55th St., New York 19, N.Y.

SALESMEN-DISTRIBUTORS

EARN Big commissions full or part time. Show America's largest line low priced business printing and advertising specialties. Calendars in season. Big free sales kit samples hundreds items used daily by business people. Build profitable repeat business. Start right now. National Press, Dept. 18, North Chicago, Illinois.

FREE To salesman, descriptions and pictures 300 wares, fast sellers for spare time cash and side line profits. No charge. Just send name, age, for sample copy Opportunity Magazine, 850 N. Dearborn, Dept. 17-G, Chicago, Ill. 60610.

EARN Extra money selling advertising book matches. Sample kit furnished. Matchcorp, Dept. PM-115, Chicago, Illinois 60632.

SELL Advertising book matches. Write us today. We put you in business by return mail; handling complete line of book matches in demand by every business right in your town! No investment; everything furnished free! Top commissions daily. Superior Match, Dept. M-1165, 7530 S. Greenwood, Chicago 19, Illinois.

ASTONISHING Automatic toilet bowl cleaner, deodorizer. Works when toilet is flushed. Housewives buy on sight for every bathroom, at only \$1.98 each. Make up to \$10 an hour spare time. Free sales kit. Meritte, 114 East 32nd, Dept. GT1R, New York 16.

HOT Money making line! Show line of business printing, advertising specialties, calendars. Watch orders pour in. All pre-printed items. Terrific commissions in full or spare time. No experience. No investment. Cash discounts to customers. Free bonus gifts to you. Free sales kits. Wilens-David, Lonestar Press, Dept. W-28, Waukegan, Illinois.

BIG profits selling automotive specialties to service stations, garages. Free wholesale price list. Inka Industries, 2401 Crocker, Houston, Texas 77006.

\$5,000 For Part of your time. Your own business. Free selling outfit. Opportunity to profit a year including cash commissions, monthly bonus, bonds, free insurance. Age no barrier. Full time or part time. No obligation. Salem-Vent, 11510 Brand Road, Salem, Virginia.

LEARN To sell the Holy Bible. We teach you how. For attractive profits, deal direct with publisher of 22 editions. Write Dept. PM, Bible Publishers, Box 5065, San Antonio, Texas 78201.

AMAZING Hanson® hand soap sells itself. No mechanics, printers, or men who work with their hands—pays 122% profits—fast! Free details. Cheva Chemicals, Room 34, Chester, Va. 23831.

\$1,000.00 a month for making dramatic 3-second demonstration of amazing Lightweight Presto Fire Extinguisher. New chemical used by Airforce snuffs out fires instantly. Only \$5.95. Terrific commissions. Millions want it. Free Kit. Meritte, 114 E. 32nd, Dept. E-66F, New York 16.

WANTED! Manufacturers' representatives for Model Raceways; true Best made! Guaranteed prosold! Many leads! Only first rate need apply! Great designs, including "Sunika" Model Raceways, 872-P4 Mass Avenue, Cambridge, Mass.

CALENDARS Novelties. Full or part time. Liberal commissions. Fleming, 6335-A Cottage Grove, Chicago 37.

SENSATIONAL New longer-burning light bulb. Amazing free replacement guarantee—never again buy light bulbs. No competition. Multi-million dollar market yours alone. Make small fortune even spare time. Incredibly quick sales. Free sales kit. Meritte (Bulb Div.), 114 E. 32nd, Dept. C-73R, New York 16.

AGENTS WANTED

ESTABLISH Your own business. Low prices on used clothing, shoes, household items. Unlimited profits. Free catalog. Northwestern Distributors, 2129 N. Western Avenue, Chicago, Illinois 60647.

AMERICA'S Biggest value wedding line! Big 40% profit showing wedding invitations and over 50 exciting accessory items. 10% sideline for Christmas. Free catalog. salesmen. Write for free display album. Elmcraft, Dept. EW-160, 7201 S. Cicero, Chicago, Illinois 60629.

SALESMEN Make big profits selling "do-it-yourself" sign kits to merchants. Information free. Signmakers, Inc., Dept. PM4, Box 6656, Denver 16, Colorado.

RAISE Rabbits for us on \$500 month plan. Free details. White's Rabbitry, Mt. Vernon, Ohio.

MAKE UP to \$50.00 daily soliciting delinquent accounts. Terrific commissions. General Finance Co., Dept. LC-78, Pickwick Bldg., Kansas City, Mo. 64106.

PRINTING. Advertising salesmen—Excellent, long-term sideline selling delocalomani name plates, small quantities. Automobile initials, sign letters. Free samples. Ralco, XL, Boston 19, Mass.

WILL You test new items in your home? Surprisingly big pay. Latest convenience for home car. Send no money. Just your name. Kristler, 144, Akron, Ohio.

I'LL Send you full-size famous Blair home products for free trial, to help you make more money, spare time or full time. Show friends, neighbors, take easy big orders, make generous profits. Write Blair, Dept. 31BX, Lynchburg, Va.

250,000 NEW Mothers every month! Bonanza for bronzed baby shoes! \$50.00 a day profit. No investments, no inventory. Full or spare time. Exciting details free. Sentimental, 1919 Memory Lane, Dept. 8L, Columbus, Ohio.

MAKE Big profits with new sensational Vacuumatic-Broom mop. Amazing polystyrene foam sucks up dirt, holds dust like magnet. Tough as leather. Use damp, wet or dry. Details only \$1.95. Rush \$1.00 for sample demonstrator, exciting details free. Coats Co., 8427-Q South Chicago Ave., Chicago 60617.

YOUR Own business—Used suits \$1.50; overcoats 65¢; mackinaws 35¢; shoes 12½¢; ladies coats 30¢; dresses 15¢. Enormous profit. Catalog free. Portnoy Associates, 2109-A4 Roosevelt Court, Chicago 8, Ill.

EMPLOYMENT INFORMATION

TREMENDOUS Job opportunities. Foreign-U.S.A. construction, trucking, manufacturing, Government, shipping, thousands more. Up to \$2,000.00 monthly! Money-back guarantee. Director, plus sample application form. Send only \$1.00 (\$1.25 Air Mail). Worldwide Opportunities, Box 730-A, Holland, Michigan.

FOREIGN Employment. Construction, other work projects. Good paying overseas jobs with extras, travel expenses. Write only. Foreign Service Bureau, Dept. PM, Bradenton Beach, Florida.

FOREIGN Employment: South America, Africa, Europe, Australia, USA. Earnings to \$100,000 monthly. No restrictions, all trades, professions, occupations. Many companies pay fare, housing, benefits, bonuses. Write: Universal, Dept. A-2, Woodbridge, Connecticut 06525.

BOOMING Australia needs your skills! Government assisted passage. Details \$2. Heyer, 2013 Chestnut, Costa Mesa, Calif.

THOUSANDS California jobs available. 1966 edition Callfacts list 600 commercial and aerospace companies, with brief description \$2.00. Compiled by California Employment Information Firm. Infomart, Box 45345, Los Angeles, 90045.

DIRECTORY Reports. Construction, aviation, shipping, oilfields, government, manufacturing, trucking, etc. foreign-stateside. Helpful information plus job-getting tips on preparing application letters. Unconditional money-back guarantee. Only \$3.00 (\$3.25 airmail) Research Services, Box 6768-PM, St. Louis, Missouri 63144.

HELP WANTED

MAKE \$280.00 getting just 10 growers to try Campbell's Plant Food. Sample free. Campbell, Rochelle 24, Illinois.

SELL Swami car polish cloths big money-makers, 2½ million sold since 1951. Retail \$2. Salesman's samples \$1. Write: Swami Cloth, Box 24, Great Neck, N.Y. 11023.

FARMS—REAL ESTATE

ABANDONED Timber Leaseholds! Choice 640 acre Sportsmen's paradises still available—\$20.00 plus \$6.50 Taxes yearly. Maps, pictures, \$1.00 (Refundable). Director, Erindale 4, Ontario, Canada.

CANADIAN Land, priced from \$4.00 an acre! Acquired through estate liquidation. Title guaranteed. No mortgage, small monthly payments. Our lists describe finest properties in Canada. Best hunting, fishing locations, ideal for camps, cottages. Live in Canada's minerals, farms and forests. Free descriptive booklet. Canadian Estate Land, 2788-P Bathurst Street, Toronto, Ontario, Canada.

CANADIAN Vacation lands: Full price \$185.00, 40 acres, \$10 month. Suitable cottages, slide, swimming, fishing, investment. Free information. Land Corporation, 3768-O Bathurst, Downsview, Ontario, Canada.

GOVERNMENT Lands low as \$1.00 Acre! Millions acres throughout U.S. Free details! Land Division, Box 26034-PJ, Indianapolis, Indiana 46226.

CANADIAN Lands, seized and sold for taxes. Our 48th annual series of lists, describe many choice properties, situated from coast to coast, acquired by us through tax sale. Priced as low as five dollars per acre, guaranteed perfect title, small monthly payments, no mortgage. Beautifully situated hunting and fishing camps where there is real sport; summer cottage sites, heavily wooded acreages. Now is the time to invest in Canada's minerals, forests and farms. Write for free literature. Tax Sale Service, Room 301-D, 85 Bloor St., E., Toronto 5, Canada.

400,000.000 ACRES Government public land in 25 states. Some low as \$1.00 acre. 1965 report. Send \$1.00 National Land, 422PM, Washington Building, Washington, D.C.

FLORIDA Campsites—deep in the heart of the great Ocala National Forest. Good for hunting and fishing. Free maps and photos. Howard Vernor, DeLand, Florida. AD46369D

FREE Fall-winter catalog! Bargains galore! Coast-to-Coast! Low prices, easy down payments. See-Buy Real Estate Agency, 712-PM West Third, Little Rock, Ark. (Please include Zip Code)

FREE! 152-page real estate catalog! Over 1700 pictures! Farms, ranches, homes, businesses, vacation and retirement properties in 28 states, coast to coast! United Farm Agency, 612-PM West 47th St., Kansas City, Mo. 64112, Plaza 3-4212.

NORTH Florida lots, 50x100 each, \$5.00 down and monthly, total \$295.00. Free literature. Casper Corp., 3970 N.W. 177th St., Miami, Fla.

BUY Without risk for Retirement, Vacation, or Investment, under America's only "No-Risk Purchase Plan" in Carolina Coast multimillion dollar, 14,000 acre development, 10-year guarantee. Payments less than \$5.00 monthly! Shopping center, motel, hunting, fishing, golf, country club, right on property. Private ocean beach. Write for free literature. Boiling Spring Lakes, Southport I-L, North Carolina 28461.

FREE Flat Strout catalog. It's big! It's great! 180 pages of top value offerings. 490 offices in 35 States. Coast-to-coast. Our 65th year. Don't wait. Write one of the first. Send for your Free catalog today. Strout Realty, 7-CJ S. Dearborn, Chicago, Ill. 60663.

"CAL-ORE Ranches" in Oregon's Rogue River Valley near Medford and Grants Pass 22995 to 55995. Pay \$150 down \$25 monthly. Free catalog. Cal-Ore Ranches, 1054PM South Riverside, Medford, Oregon.

81 ACRES—Canadian border—hundreds campsites, islands, farmlands, directly from tax authorities. (Non-Can't) Lists, photographs mailed. Register, Room 203, 32 King St., E., Toronto 1, Canada.

FARM AND GARDEN EQUIPMENT

YOUR Ad in this space will be read by more than 1,400,000 active mail order buyers. Join the march to greater profits, place your products and services in front of them. Write for mail low cost classified ad. For further details, write: C. A. Martin, Dept. 43N, Popular Mechanics, 575 Lexington Avenue, New York, New York 10022.



PLANTS AND NURSERY SUPPLIES

GINSENG Bringing \$14 pound. Have seeds, plants, Goldenseal. Full information. K. Collins, Viola, Iowa 52550.

WANT Greatest cash crop working for you? Write Ginseng, Asheville 53, N. C.

INDOOR Greenhouse—portable, attractive, lightweight, controlled conditions, for home or office. Literature free. Greenhouse, P.O. Box 1839, Tampa, Florida 33601.

FIBERGLASS Greenhouses, build your own. Prices reasonable. Greenhouse Specialties, 9849-B Kimmer Lane, St. Louis, Missouri.

GIANT Ponderosa pine cones, 4 for \$1.00. Box 266, Penticton, B.C. Dealer enquiries invited.

HOME CRAFTSMEN

WOODWORKERS -- Home craftsmen! Catalog containing lamp parts, veneers, lazy susan bearings, Swiss movements, chair cane, folding metal legs, wooden legs, mouldings, furniture hardware, finishing materials, and much more. Baran Specialties, Box 2044-DE, Chicago 60609.

2512 PLANS, Patterns, things to make, do. Fun. Profit. World's greatest selection. New catalog 10¢. Craftplans, 16250-A Harwood, Homewood, Ill.

FREE "Do-it-yourself" Leathercraft Catalog, Tandy Leather Company, 1001 Foch-Dept. H55, Fort Worth, Texas 76107.

101 PATTERNS Of smart gifts, novelties, shovels, action windmills plus "Make Money" Jig Sawing, \$1.00. Mastercraft, 115M, 7041 Olcott, Chicago 60631.

FREE! Big 80 page Leathercraft catalog, 100's of new items! MacPherson Bros., Dept. K, 730 Mission St., San Francisco, Calif. 94103.

GAS Fueled forges for blacksmithing, anvil, etc. free information. Pyramid Products, Box 55, Fayetteville, Arkansas.

KNOCKDOWN Cedar chests, also over fifty kits, Catalog 25¢. Glen Kendall Co., Huntsville 2, Alabama.

BUILDERS! Make rafter cutting easy! Free information. Emmert Products, Sycamore, Illinois 60178.

MAKE \$100.00 Formica counter tops with few dollars' material. Complete instructions \$1.00. Build cabinets like professionals, with new manual, "Cabinet-making Made Easy", \$2.00. Japs, 126-P Seventh North, Hopkins, Minn. 55343.

SKILL-CRAFTS New '65-96 catalog. Largest and finest selection of leathercraft, art, hobby-craft supplies in the world. Free gift with first order. Send 50¢. Refundable with first order. Skill-Crafts, Box 105-P, Joplin, Missouri.

PLANS, Bird houses, feeders. Ready built houses and feeder. Illustrated catalog, 25¢ coin. Yeager, 1665 Linden, Homewood, Ill. 60430.

WOODWORKING Catalog and manual, 25¢. Plus free 101 Project Ideas. "World's most beautiful veneers, lumber, plywood. Wood finishing, upholstery supplies. Furniture hardware. 2,000 needed workshop products. Constantine, 2051-S Eastchester Road, Bronx 10461.

CLOCKWORKS For homemade ease. Postpaid: 5¢ electric, \$6.90; 2 1/2" wind-up, \$6.90. Barrow, Box 522, Chapel Hill, N.C.

CUTTERS 3/16 shafts 48, \$3.00; Mounted stones 1/4 shafts 24, \$4.00; high speed cutters 1/8 shafts 15, \$10.00. Schrader Instrument, 219 East First, Independence, Iowa 50644.

WALNUT, Cherry, silver maple, gun stock squares. Lumber, picture frame moulding. Midland Lumber Company, Box 262, Savannah, Missouri.

DO-IT-YOURSELF

FLUORESCENT Tubes rejuvenated at no cost. Instructions \$1.00. Rejuvenators, 172 Bolton St., Portland, Me.

EASY To build, unusual toys for Christmas. Catalog, \$1.00. Toy Research and Development, Box 71, Fairport, N.Y. 14450.

PREHISTORIC Shark tooth bracelet kit; complete; attractive silver-black; 10 minutes to make; \$1.00. Sea Maid; Box 965, Venice, Florida 33595.

BUILD Your own tractor plans. Free information. Eltracore, Dept. A, Camptonville, California 95922.

ORNAMENTAL Iron: Direct from factory to at wholesale prices. Install yourself and save. Duley Steel Products, P.O. Box 351, Dexter, Mo. 63841.

SIGNS Easily painted by you with our letter patterns, supplies, raised letters. Pawlow, Crystal Falls, Michigan 49920.

AUTOMATIC Washer repair manuals for: Frigidaire, General Electric, Hamilton, Hotpoint, Kelvinator, Kenmore, Norge, RCA Whirlpool, Speed Queen, Westinghouse, \$2.50 ea. PFD, Refrigeration parts catalog, 50¢. Sunbeam appliance parts list, 25¢. Major Appliance, 13106 Caine Ave. (Dept. M), Cleveland 5, Ohio.

SAVE On plumbing bills. Fully illustrated book. Covers repairs, stoppages and installations. Saves owner hundreds of dollars. Only \$2.00. Satisfaction guaranteed. Rex Publications, Box 3, Sunland, California.

FREE Details. Marshall's directory of "How-To-Do-It" books. Marshall's, 1135A So. Birmingham, Tulsa, Oklahoma 74104.

ARTS AND CRAFTS

MAKE Figurines, plaques, lawn ornaments, Molds, plastercraft kits, liquid rubber. Sample and catalogue 10¢. Woolley Company, Box 29-B, Peoria, Illinois.

BINOCULARS, TELESCOPES, MICROSCOPES, MAGNIFIERS

SCIENCE Bargains! Lenses, telescopes, binoculars, microscopes, kits, parts, war surplus. Send \$1.00 for beginner's 10-lens kit with instruction booklet. Order Stock 2-CH. Request free 148 page Catalog CH. Edmund Scientific Co., Barrington, New Jersey.

BINOCULARS Direct from manufacturer. Quality, tremendous savings! Request catalog. Koyu, 3560 Crenshaw Blvd., Los Angeles, Calif.

BUILD Your own reflector telescopes: complete kits; Mirrors, eyepieces, tripods. All other accessories, request free illustrated literature. Criterion Manufacturing, Dept. KPM-32, Hartford, Connecticut.

BINOCULAR Sale! Free color catalog 100 models \$9.95-\$250.00. Write, United, 9043 So. Western BCAT-5708, Chicago 60620.

DYNASCOPE -- Amazing world-famous reflector telescope. Request free brochure. Criterion, Dept. DP-33, Hartford, Connecticut.



CAMERAS AND EQUIPMENT

YOUR Ad in this space will be read by more than 1,400,000 active mail order buyers. Join the march to greater profits, place your products and services in front of them today with a small low cost classified ad. For further details, write: C. A. Martin, Dept. 49N, Popular Mechanics, 575 Lexington Avenue, New York, New York 10022.

PHOTO SUPPLIES

TELL The more than 1,400,000 avid readers of Popular Mechanics about your products and services. It costs very little to place your classified message in front of these proven mail order buyers. For further details, write: C. A. Martin, Dept. 50N, Popular Mechanics, 575 Lexington Avenue, New York, New York 10022.

PHOTO FINISHING

COLOR Movie Fans! 8 MM expertly processed for just \$3.10 including fresh Kodachrome Film. All mailed back next day First Class. Craftsmanship guaranteed. Send exposed reel or request Free Mailing and Price List of complete services. Direct Mail Photo, Box 8352-PM, Pittsburgh, Pa. 15218.

A FREE Kodak roll returned with each black and white or Kodachrome developed and printed, fast service, lowest prices, guaranteed quality send for free mailers. Economy Photo Service, Dept. P. M., Box 111, Albany, N.Y.

FAST, Hi-quality Finishing. Kodacolor rolls; eight jumbo prints \$1.99. Twelve \$2.49. Twenty \$3.49. Reprints 15¢. Also low B&W prices. Custom Quality Studio, Box 4838-PM, Chicago 60680.

BLACK, Color films process. For \$1.00, 4x5 and 8x7 for \$1.00 each. Henry Turner, 520 Cleveland Ave., Schenectady, New York.

LIVING Color portraits on silk 100% oil. From snapshots or photos. Professional art. Japan exotic fascinating. Free details. Cooks Import, Dept. 2411 Gage, Huntington Park, California.

COLOR SLIDES

NEW! Hilarious comic title slides. Send dime for list. (Deductible first order). Colonial, 247A, Swarthmore, Pa.

NEW WORLD's Fair, 1964 exclusive set 100 35mm 3x2 1/2 color slides, \$14.99 plus 28¢ postage. Biggest selection high quality slides available anywhere. Catalog free. Blackhawk Films, 424 Eastin-Phelan Bldg., Davenport, Iowa 52805.

MOTION PICTURES AND SOUND EQUIPMENT

5,000 8-16 MM. Movie films. Free catalogues. International, Greenvale, N.Y.

16MM Sound films features and shorts. Bedner, 5300 So. Taiman, Chicago.

8MM MOVIES. 2"x2" Color Slides -- biggest selection anywhere! World's Fair, railroad, antique automobiles, circus, World War II, Hollywood classics, travel, wild life and many others. 16mm, new, used films also. Big Blackhawk catalog free. Blackhawk Films, 424 Eastin-Phelan Bldg., Davenport, Iowa 52805.

FREE Catalog! Save on 8mm-16mm, film and supplies. Superior, 448 N. Wells, Chicago 10.

CAPTURED Nazi film. Guaranteed authentic. Sample 50¢. Sanford, Fairview, Pennsylvania.

16MM PROJECTOR Parts, films. Gordon, 28-53 Steinway Street, Astoria, L.I., N.Y. 11103.

16MM sound-projectors, films, new, used for sale. Free catalog. National Cinema, 71 Day Street, New York City, N.Y.

16MM SOUND Shorts, cartoons, features. Cinemas Films, 10314 Perry Ave., Chicago, Ill. 60628.

COLLECTORS! Directory-suppliers, 25¢. Filman Monthly, 210 Durham, New Westminster, B.C.

MOVIE Film! Free catalog! ESO-R, 47th Hily, Kansas City 12, Missouri.

RADIO, TELEVISION AND HAM EQUIPMENT

SAFEGUARD Privacy! New instrument detects electronic "bugs," wire-tapping and snooping devices. Free information. Dee Equipment, Box 7263-E4, Houston 8, Texas.

32¢ RADIO & TV tubes. Free list. Cornell, 4213-17 University, San Diego 8, California.

KITS. Solar powered radio, \$3.95; wireless transmitter, \$4.95. Electronix, Box 1067, Southgate, Michigan 48185.

GOVERNMENT Surplus electronics, infra-red equipment. Catalog 20¢. Meshna, Nahant, Mass.

BRAND New tubes. World's lowest prices on radio, TV-industrial, special purpose tubes. Write for free parts catalog. United Radio, Newark, N.J.

STEREO Tapes. Save up to 60% (no membership fees, postpaid anywhere USA). Free 60-page catalog. We discount batteries, recorders, tape accessories. Beware of slogans "not undersold," as the discount information you supply our competitor is usually reported to the factory. Saxstone, 1776 Columbia Road, Washington, D.C. 20009.

ALLWAVE Radio Kit shortwave police etc. Tube and transistor included \$3.00. Headphones \$2.00. Ekeradio, Box 131, Temple City, Calif. Free information.

SAVE Money on TV and radio repairs. Free catalog. Telefixit, Box 714, Manhasset 1, N.Y.

HIFI, RECORDS AND ELECTRONICS

McGee Radio Company. Big 1966 catalog sent free. America's best value. hi-fi amplifiers, speakers, electronic parts. Send name, address and zip code number to McGee Radio Company, 1901 McGee St., Dept. PM, Kansas City, Missouri 64108.

RECORDS! Discounts on all LP's. Free details. Citadel Record Club, 545 Fifth Ave., Dept. 2, New York 17, N.Y.

NEW Mfrs. surplus record changers, B.S.R. stereo cartridge & 45 adapter, \$15 each. Changers Inc., Box 144, Jerome Ave. Bx., N.Y. 10968.

"CHAMBER" Design special Hi-Fi bookshelf speakers, systems. Factory direct wholesale prices. Free information, Synco-Stereo, Box 207, Tinley Park, Illinois 60477.

TAPE RECORDERS, hi-fi components. Sleep learning equipment, tapes. Unusual values. Free catalog, Dressner, 1523 Jericho Tpke., New Hyde Park 3, N.Y.

BARGAIN Electronics catalog, 25¢ refundable. Electrolabs, Department D8345, Hewlett, New York 11557.

EXCLUSIVE Free catalogue: extraordinary hard to find hobby party records. Record Suppliers, 300 Chelsea, Louisville Kentucky 40207.

SINGLE Thermoelectric couple introduces you to basic principles of solid-state cooling, remarkable space-age process being applied to thousands of cooling products. Freeze water! Determine maximum heat-pumping current, etc.! Kit includes: T-E Couple, background information and complete instructions. \$1.00 ppd. Frigistors Ltd., 5770 Andover Ave., Montreal 9, Quebec.

FM STEREO Tuner, alignment generator. Kit, \$79.50. Amerlab, 471 Clifton Ave., Newark 4, N.J.

RECORDING Tape, low prices. Send for free brochure "Tips On Taping". Tape Library Supply, 612 Goodman Street, Bakersfield, Calif. 93305.

FREE - Free - Free - Free - Free - Free. Send in for your free one year subscription to Olson Electronics' fantastic value-packed catalog, unheard of low prices on brand name speakers, changers, tubes, tools, stereo amplifiers, tuners, CB and other values. Credit plan available. If you have a friend interested in electronics send his name and address for a Free subscription also. Olson Electronics, Inc., 428 S. Forge St., Akron, Ohio 44308.



MUSIC AND MUSICAL INSTRUMENTS

GUITAR. Banjo Making books, Plans, woods, necks, tools. List 15¢. Saitnwood, 510 East 11th Street, New York 9, N.Y.

POEMS Wanted for new songs and records. Send poems. Five Star Music, 603 Beacon, Boston 8, Mass.

GUITARS, \$11.95. Electric double pickups with tremolo bar, \$49.95. Conditions: \$125.00. Concertinas, \$350.00. Drums pearl set, \$99.00. Wind instruments, \$39.95. Free Catalog, Melody Music, 4951 W. 95th St., Oaklawn III.

SONG Ideas wanted. Write with active professional songwriters with publisher contacts. Records made. Share royalties. Send ideas - free examination. Songwriters' Associates, 236 W. 55th, N.Y. 19-P.

ELECTRIC Guitar kits, patterns, parts. Send 25¢. Kits, 3526 California, Peoria, Illinois.

USED Professional guitar, amplifiers, drums. Send 25¢. Hills, 3526 California, Peoria, Illinois.

INCOME Guaranteed two years for song-poems accepted! Free public release; Castle's, 203PM West 46th Street, New York City 10036.

PIANO Self-Teaching Book. Includes popular, classical, harmony, theory, chords, scales. Price \$5.00. LaPort Publishing Company, Box 606-P, Franklin, Michigan 48025.

SONGS, Songpoems: Wanted for radio show. Hollywood Music Productions, 6425-B13, Hollywood Boulevard, Hollywood, California 90028.

ACCORDION-O-Rama. Top brand accordions. Tremendous discounts, 120 bass, 5 switches from \$119.00. Trades accepted. Free brochure. Accordion-O-Rama, 874 Broadway, New York, N.Y. 10003.

PLAYER Piano books. Free catalog. Vestal Press, Vestal 11, N.Y. 13850.

GUITARS! Lowest prices, best deal in country. Famous brand catalogs free. Universal Guitars, 20 Cent. Great Neck, N.Y.

SONGPOEMS Wanted. Send poems for offer. Nashville Music Institute, Box 532-PM, Nashville, Tennessee.

ACCORDIONS. Guitars, band instruments! Save to 50%. Famous makes. Easiest terms. Trades accepted. Free home trial. Free discount catalog. Mention instrument. International Music Mart, 5535-R Belmont, Chicago 50641.

SONOS And song poems wanted. Royalties. Tin Pan Alley, Inc., 1650 Broadway, New York, N.Y. 10019.

DRUM Sets, lowest prices, no money down, 10 day free trial. Send for our free catalog. Wonderland Drum Company, Box 621PM, Detroit, Michigan.

SPINET PIANO (new) \$399.00, 15 year Warranty. No money down. Send for our free brochure. Wonderland Musical Instrument Company, Box 621PM, Detroit, Michigan.

CLARINETS, Trumpets, guitars, violins. All band and orchestra instruments. At lowest prices, 10 day free trial. No money down. Send for our free brochure (specify instrument). Wonderland Musical Instrument Company, Box 621PM, Detroit, Michigan.

SONGS Or song ideas wanted by new commercial recording company for release to disc jockeys and public. Preview Records, 6311-B Uccia, Hollywood, California 90028.

SONGWRITERS. Poets, Composers share \$33 million dollars! Free details, free song. Nordke Songs, 6000-19 Sunset, Hollywood, Calif. 90028.

SONGFORMS Wanted! Collaborate with professional songwriters equally. Share royalties. Songwriters Contact, 1619-D Broadway, New York 19.

GUITAR Songs, finger style, lesson. Mailed Weekly, 3 months, \$3.00. DR Publishing, Box 4346, Long Beach, Calif.

MUSICAL Instruments, new and used, bought and sold. Lee Mountain, Henegar, Alabama.

WANTED: Piano rolls, ampico or duoret. Also nickelodian. Drummond, Ingotmar, Penna.

LEARN Harmony, arranging, 10 Lessons complete. Write Box 504, Miami Beach, Fla. 33129.

GRANADA, Jallisco, La Paloma, 50 favorite Spanish songs, \$1.00. Mondragon, 1305 F. Forester, Albuquerque, N.M.

VIOLIN And guitar makers, send for latest catalog of instruments and accessories. International Violin, PM-8, 414 East Baltimore St., Baltimore 2, Md.

WHO Else wants songwriting success? Details free. Melody Writers, 2 Emma Street, Greenville, S.C.

SONGWRITERS: We provide every service you require to write hit songs. We don't write artists who aren't interested in selling their songs. National Songwriters Guild, Box 1987H, Ormond Beach, Florida.

ACCORDION Manufacturing, 6343-P South Ashland, Chicago, Illinois 60636. Piano Accordions, Chromatics, Honners, Concertinas, Guitars. Wholesale catalogs free.

GUITAR Self-Instructive books, \$1.00. Hrudka, Box 950, Chicago 90, Ill.

CLASSIC Guitar plans, book, materials catalog, \$6.00. Joseph Wallo, International Building, Washington, D.C.

POEMS Wanted for musical setting and recording. Send poems. Free examination. Crown Music, 49-C West 32, New York 1.

ELECTRIC Guitars, amplifiers, wholesale. Free catalog. Carvin, PMM, Covina, Calif.

EDUCATION AND INSTRUCTION

SWEDISH Massage and Physical culture pays big profits. Learn at home. Diploma. Free catalog. National Institute, Dept. E115, 307 North Michigan, Chicago 1.

AUTOSUGGESTION. Sleep-learning headquarters! Tapes, records, books, scientific catalog free. Research Association, Box 24-PM, Olympia, Washington.

PIANO Tuning quickly learned with home study course. Diploma granted. American Tuning School, Gilroy, Calif.

LEARN Civil and criminal investigation at home. Earn steady good pay. State Institute Applied Science, 1200 Sunnydale, Dept. 168, Chicago 40, Illinois.

MASTER Watchmaking at home. Free sample lesson. Chicago School, Dept. YX, Fox River Grove, Illinois 60021.

USED Correspondence courses and books sold and rented. Money back guarantee. Catalog free. (Courses bought.) Lee Mountain, Pisgah, Alabama.

HIGH School diplomas at home. Licensed teachers. Send age, highest grade completed for free detail. No salesman will call. Southern States Academy, Professional Bldg., Dept. 16, Decatur, Ga.

PENMANSHIP Corrector. Improve poor penmanship quickly. Details free. Osmont, Box 665-34, St. Louis 88, Mo.

COMPLETE Your high school at home in spare time with 68-year-old school. Texts, lesson mechanics in our shops. Information booklet free. American School, Dept. X-945, Drexel at 58th, Chicago 37, Illinois.

MEN Wanted. Earn \$125 a week and up. Master a trade with a future. Learn auto diesel mechanics in our shops. You learn with tools on real equipment. Earn while you learn. Many of our graduates earn \$125 a week and up. Write for free bulletin. Dept. 256, Auto Diesel College, Nashville 3, Tenn.

OWN Collection agency, "Little Gold Mine!" Franklin Credit, Roanoke, Virginia.

LEARN To drive tractor, trailer, trucks, buses. Short concentrated courses available. Write for free brochure. Driver Training Institute, 794 Bedford Ave., Brooklyn, N.Y. Ja 2-5080.

LEARN Auctioneering. Term soon. Free catalog. Reich Auction College, Mason City 15, Iowa.

LEARN Asleep or awake! Records, tapes, equipment! Free catalog! Drawer, PM-409, Rookwood, New Mexico.

BOOKKEEPERS. Operate your own "Dollar-A-Week" system. Ellis, Box 200, Cedar Grove, North Carolina.

INVESTIGATOR'S Course. Credentials, diploma. Free information. Southwestern Institute Criminology, Box 201, Geronimo, Oklahoma.

BE A real estate broker. Insure security for yourself and your family. Study at home. Prepare for state examination. Write for free book today. Free Catalog of Real Estate, 3519-P Broadway, Kansas City, Mo. 64111.

LEARN Air freight. Unlimited opportunities! Fastest growing transportation industry. Licensed correspondence school. Free details. Air Freight Institute, 5267-PM North Natomia, Chicago 60656.

PIANO Tuning pays. Big money in spare time. Learn at home. No musical knowledge necessary. Phonograph, records, tapes, and instructions furnished. Electronic tuning also taught. Free catalog. Capital Tuning School, 3160 S.W. 16th Court, Ft. Lauderdale, Fla.

SWEDISH Massage. Foot technique. Post graduate. Home study. Residential. Diploma. Mr. Swanson's Illinois Licensed School, 3890-PL Alta Vista, Chicago 13.

ATTEND The Nation's finest. Write. Galion Welding School, Galion, O.

MISSOURI Auction School. Free catalog! 1330-03 Linwood, Kansas City, Mo. 64109.

FINGERPRINTING Easily learned at home. Many job opportunities. Diploma awarded. Alabama School of Fingerprinting, Fairfield, Alabama.

LEARN To service oil burners. Free information. Mar-Linn Institute, Box 66095, Portland, Oregon 97266.

IDEAS How to get 'em! 30 step course with 45 charts. \$5. Rutterby, 660 Pinecrest, Holland, Michigan.

USED Courses! Bookal! List 104. Smith's, 124 Marlborough, Salem, Mass.

B.S. DEGREE (Engineering) or College Entrance by home study. Send \$1 for 1965 prospectus. CIST, Suite 801, 263 Adelaide St., W., Toronto, Canada.

LEARN Landscaping and the growing of plants. Start a profitable business part or full time. Free information without obligation. Lifetime Career Schools, Dept. MC-1152, 11826 San Vicente Blvd., Los Angeles, Calif. 90049.

GAME Warden, Government hunter, forestry, park and wildlife services announce job openings regularly. Prepare at home for outdoor work, good pay, security. Complete information free! Write North American School of Conservation, 941-AZ North Highland, Los Angeles, Calif. 90038.

LEARN Special investigation. 20 Lessons, credentials, diploma, future. International Academy of Police Science, Oklahoma City, Oklahoma.

GET A British degree. Divinity, Philosophy, Radiology, 35 courses. Prospectus free. Brantridge Forest School, USA Representative, Box 357, Lincoln, Montana.

HOW To get better grades in high school. \$1.50. GMWL Books, Box 544, Pacific Grove, Calif.

DETECTIVES—Secret investigations. Experience unnecessary. Detective particulars free. George Wagner, M125 West 86th, New York 10024.

SLEEP Learning! Sensational LP record. Free trial! Incredible sleep power, mastery. Write: Forum, 333-J10 Michigan, Chicago 60601.

MEN, Women—want higher pay? Take advantage of hundreds of well paying jobs in business and industry. Unusual training study. Write: Home, while you work. Get literature. Aladdin Home Study Courses, Dept. B, 409 St. Louis, Mo. 65066.

FCC License in 6 weeks. First class radio telephone. Results guaranteed. Elkins Radio School, 2603D Inwood, Dallas, Tex.

FEDERAL Income tax course. Details free. Taxmaster Systems, Box 1841, Orange, California 92669.

TELEVISION: Electronics: Appliance Repairing; Mailorder (Low cost courses) Guaranteed. Write free. Mike Blizzard Company, Linwood, N.J.

EARN College credits and degrees through correspondence, residence and examinations. William Darren University, Fourteen North Central Avenue, Phoenix, Arizona 85002.

NEW Home radio course only \$26.95 complete. Tubes, components, tools, books included. Free literature. Ure-Kits, Department 633B, Hewlett, New York 11557.

USED Courses, books, Catalog, 104 Courses bought! Bayles, 78B Courtright, Wilkes-Barre, Penna. 18702.

BE Your own tax expert. Learn income tax inexpensively. No salesmen. Box 1225, Akron, Ohio.

BOOKKEEPERS Operate your own "C.A.A.-Webs" system. Ellis, Box 200, Cedar Grove, North Carolina.

LEARN Technical Metaphysics—The Ancient Masters' method of healing. Easy to learn, inexpensive. For free details write to: Premier College of Technical Metaphysics, P.O. Box 93, Uchelet, B.C., Canada.

FREE Catalog self-improvement books. Cregan, 360 Arlington, Brooklyn, N.Y. 11208.

DETECTIVE Course. Free information. Universal Detectives, Box 8180-F, Universal City, California 91506.

CHOOSE Your future scientifically! Take Intensive Vocational & Educational Guidance tests, IQ Tests and Emotional Evaluation Tests in the privacy of your own home. Mail answers and receive personal written reports by trained vocational specialists. Discover your hidden God-given natural abilities. Free Literature that can point the way to a happier and more financially rewarding future. Write: Psychological Testing Center, Dept. P-A, 3212 West Lawrence Ave., Chicago, Ill. 60625.

FENMANSHIP Book: Simplified. Improve your handwriting. Details free. T. Tevis, Chillicothe, Mo.

EDUCATIONAL Shortcuts? Unusual guides, directories list vocational, graduating, professional opportunities. Auream, Allenhurst, New Jersey.

EARN Valid undergraduate or graduate degree through correspondence. Catalog gratis. Registrar, Bretton Woods University, 2936 East 10th Street, Indianapolis, Indiana.

COLLEGE Courses at home on LP records. First year courses recorded by world-famous teachers, including 8 Pulitzer Prize winners. Credit at over 100 colleges. Free catalogue. Institute for University Studies, Dept. 76, Bergenfield, New Jersey.

DRAPERIES: Save money! Learn at home. Complete course, \$15.00. Eyer Upholstery School, 43 W. Apple, Dayton, Ohio 45402.

WOODWORKING And cabinetmaking course for beginning and advanced home craftsmen. Only complete low-cost home training program available. Write for free booklet, Interstate Training Service, Dept. C-3, Portland 12, Ore.

FOR INVENTORS

INVENTORS: Your ideas and inventions (patented; unpatented) expertly searched and developed for commercial appeal and cash royalty sales to manufacturers by professional invention developer with excellent record of experience. B.S., Industrial Engineering, U.S. Patent Office former Patent Examiner; U.S. Government former Patent Adviser. Second decade of reliable service! Free "Invention Record" and important information. Airmailed! Write: Raymond Lee, Invention Developer, 1606N Bush Bldg., New York City 36.

PATENT And invention development, by licensed professional patent engineer and U.S. Patent Office former examiner, and engineering specialists. Your inventions and ideas engineered for patent protection and commercial value. Inventions developed by us negotiated for cash or royalties with our nationwide contacts. Send for free protection "Invention Certificates" and further interesting, valuable patent information. George Spector, Licensed Professional Patent Engineer, Woolworth Building, New York.

PROFESSIONAL Patent searches, \$6.00, including official U.S. Patent Office copies of patented U.S. patents! Prompt, dependable service. Certified, airmailed! For free "Invention Record Folio" and important patent information every inventor should have, write: United States Inventors Service Company, 1311 "G" Street NW, Washington 5, D.C.

SAVE High fees! Prepare your patent application yourself! New "Do-It-Yourself" patent kit now makes it easy! Free "Registration Form." Miss Blaine, 306A Carry Building, Washington 5, D.C.

IMMEDIATE Cash, for patent applications. Free patent searches. Write for details. Universal Patent, 184-D, Marion, Ohio.

PATENT Searches, including copies of related U.S. patents, \$6.00. Inventors, attorneys, manufacturers use my "world-wide" airmail service! "Invention Record" form and "Information Every Inventor Should Have" free! Miss Blaine, 1029P Vermont, Washington 5, D.C.

NEVER Expose inventions, protect and make patent applications yourself. Successful inventor offers simplified legal procedure, including all materials. \$10 post-paid. Flipper, Inc., Geneva, Illinois. Mail-order operators, we drop-ship.

INVENTORS: Save time and money. Prepare and file your own patent application. Our complete "Patent Kit" makes it easy. Includes detailed instructions and all necessary material. Only \$14.75. Money back guarantee. Don't delay! Send check or money order today to: National Inventors Service, 1244-19th Street, N.W., Washington, D.C.

U.S. Patent Office Searches, 234 Broadway, Room 3615, New York. Free invention certificates.

INVENTIONS Needed immediately for manufacturers. For additional information write Kessler Corporation, C-511-FI, Fremont, Ohio.

TEST Actual value unpatented inventions for \$10, safe and fast, satisfaction guaranteed, \$1 complete. Locke, 3913 Castro Valley Blvd., Castro Valley, Calif. 94546.

TREMEUDOUS—Savings! Prepare your patent application yourself—easily—with our NEW Patent Kit! Complete instructions, materials, sample application—send \$8.95 for immediate delivery. Money-back guarantee! Congress Invention Company, 100 McKim Building, Washington 5, D.C.

INVENTIONS WANTED

INVENTIONS Wanted. Patented: unpatented. Tremendous manufacturers lists. Global Marketing Service, 2429G 77th, Oakland 5, California.

INVENTORS: Protect your ideas! Free "Recommended Procedure." Washington Inventors Service, 422P, Washington Building, District of Columbia 5.

WE Either sell your invention or pay cash bonus. Write for details. Universal Inventions, 294-E, Marion, Ohio.

INVENTORS Wanted! Manufacturers need new items! Your inventions, ideas developed for cash/royalty sales. Free "Invention Record"! Information. Raymond Lee, 1606N Bush Building, New York City 36.

INVENTORS—If you have an invention for sale, patented or unpatented, write for free brochure outlining manufacturer's requirements. Royalty rates. Kessler Corporation, C-511-FI, Fremont, Ohio.

INVENTORS Apply for then sell your patent. Write: Creative, 3680 Fifth, San Diego 3, Calif.

INVENTORS Needing Help with any problem, financial, development, securing manufacturer, obtaining patent. Write the organization that delivers action and results—no promises. Pioneer Invention Service, Dept. 83, 150 Broadway, New York 38, N.Y.

MANUFACTURING

PRECISION Model making—machining, plastic engraving, 969, South Marengo, Pasadena, California 91106.

LATHE And drillpress work. Single or multiplicable parts made to specification. Henry Meunier, 18022 Hubbell, Detroit, Michigan 48235.

MODELS—Small lost manufacturing. Metals, plastics, etc. Milburn, Burlington, Kentucky.

BUY IT WHOLESALE

USED And new watches \$2 up. Free list. Southern Watches, 5-PM So. Wabash, Chicago 3.

100,000 PRODUCTS Wholesale! Terrific bargains! Wholesalers, 1265-MR Broadway, New York, N.Y.

WORLD'S Largest wholesale supply. Buy from 7853 American, European, Japanese wholesalers. Tailormade suits from Hongkong, 123 dropship catalogs, Rockbottom prices. Free details. International Buyers, 216-M Jackson, Chicago 6, Illinois.

BUY Appliances, Cameras, Watches, etc. at factory prices plus 10%! Free details! Cam Company, 436-08 Bloomfield Ave., Verona, N.J. 07044.

BARGAINS! Buy wholesale and below. Name brands. Appliances, furniture, sports equipment, televisions, cameras, watches, jewelry, thousands more. Huge discounts! Up to \$100.00 on new automobiles. All makes. Free details. Write today: Worldwide Bargainhunters, Box 730-A, Holland, Michigan.

ELECTRIC Guitars, amplifiers, wholesale. Free catalog. Carvin PMW, Covina, Calif.

BARGAINS! Buy wholesale! Save money! Free catalog! Morris, 773 Merrick, Dept. 115 Lynbrook, N.Y.

SAVE \$888888 Buy wholesale or below thousands of items direct from U.S. and Foreign Manufacturers. Many items free! Write: Global, Box 18216-RY, Indianapolis, Indiana 46218.

POLYURETHANE Plastic coating from manufacturer for paneling, cabinets, floors, boats, glass, satin sheen, \$5.95 gallon postpaid. No COD. Auer Paint Inc., San Gabriel, California 91776.

TRAIN Sets \$1.35. Records \$2.70. Platos \$5.74. Walkie-Talkies, Binoculars, Cameras. Buy from American, European, Japanese wholesalers. Exciting details free. Envyseries, Box 160-X9, Jamaica, New York 11430.

NEW 6-Color deluxe below wholesale catalog. Automobile catalog and others. Housewares, clothing, furs, furniture, appliances, refrigerators, washers, driers, vacuum cleaners, polishers, cookware, dinnerware, strollers, cribs, radios, stereos, phonographs, recorders, musical instruments, organs, typewriters, books, binoculars, luggage, sporting goods, bowling, golf, game tables, motor scooters, motor golf carts, power mowers, chain saws, boats, motors, bicycles, clocks, watches, diamonds, jewelry. Huge discounts, hundreds name-brand items. For free list (factory prices) postcard: Selbyco-5, Decatur, Illinois.

EXPORT-IMPORT

JAPAN: Mail-Order 26 page catalog, dolls, novelties, manufacturers' names, addresses \$1.00; 1000 products illustrated trade directory \$3.00. Send cash, Yamagata Office, 814 Togin Bldg., Marunouchi, Tokyo.

SWISS Electric shaver, guaranteed for 2 years, \$55 postpaid. G. Grudt & Company, Montrose, South Dakota.

WORLDWIDE Merchandise free brochures. Pat. 270 East 60th Street, Hialeah, Florida 33012.

DROP-Ship yourself to wealth. World Import Drop-ship directory, 980 listings, \$3.00 details free. Linco, 5117 East 22nd., Tulsa, Okla. 74114.

FREE Imports from overseas. Bassens Import, 828 Fullerton, Chicago, Ill. 60614.

HOW to operate importing business. Livingston's, Box 5332, North Charleston 1, South Carolina 29406.

WATCHES Airmail direct from Switzerland. Free catalog. Neptune, 371 Rice, Elma, N.Y. 14059.

FOR THE HOME

EXCESSIVE Sunlight, why not convert to tinted windows? Write, Little Falls Import Co., P.O. 202, Little Falls, N.J.

WILD Rice. Save 40%. Raw honey. Sundries, fruits. List. Tonts, Elsinore, Calif. 92530.

OF INTEREST TO WOMEN

BEAUTY Demonstrators—to \$5.00 hour, demonstrating famous Hollywood cosmetics, your neighborhood. For free samples, details write Studio Girl, Dept. 0P-352, N. Hollywood, California.

DOLLS! Dolls! Dolls! We teach you to make, repair, dress and sell. Study at home. Earn while learning. Free booklet. Doll Hospital School, Studio MC-1154, 11826 San Vicente Blvd., Los Angeles 49, Calif.

LEARN Expert cake decorating, candy making. Free details on home instruction method. Candy & Cake, Box 54-ADH, Redondo Beach, Calif.

TRIPLE Timer! Only \$3.98! Free catalog. Bell, Box 432, Asbury Park, N.J. 07713.

MAKE Money writing short paragraphs. Information free. Barrett, Dept. C-27-K, 6216 North Clark, Chicago, Illinois.

BUTTONS 800, \$1.00. Quiltpatches 300, \$1.00. Nyloncups 40 yards, \$1. Schaefer, Drummondville, Quebec.

WOMEN! Make big money at home. \$10.00 profit in an hour possible with invisible mending. Make holes, tears disappear from clothing, fabrics. Steady year-round demand from cleaners, laundries, homes. Details free. Fabricron, 1533 Howard, Chicago 26, Illinois.

NYLON Lace, 60 yards \$1.00. ric-rac, 30 yards \$1.00, glowing colors—minimum length 8 yards. Nucleus, Dept. PM, Box 670, Ossining, New York 10563.

ORCHID Amethyst dangle earrings, screw style, gold color. Send postal order \$2.25 to The Lepidary, 25 Ord St., San Francisco 94114.

\$200.00 MONTHLY Possible, sewing babywear! Write: Cuties, Warsaw 9, Indiana 46580.

WATCHES, OLD GOLD, JEWELRY

USED Pocket and wrist watches, needing repairs, 5 for \$10.00; in running condition, 5 for \$25.00. Joseph Bros., 5 South Wabash, Chicago 3.

CASH immediately for old gold, jewelry, gold teeth, watches, diamonds, silverware, spectacles, platinum, mercury. Free information. Rose Industries, 29-A East Madison, Chicago 2.

HIGHEST Cash for gold, jewelry, gold teeth, rings, diamonds, watches, silver, platinum, all information today. Free gift with information. Chicago Gold & Precious Metals, 6 E. Monroe, Dept. 2538, Chicago 3.

WANTED. Gold, silver, platinum, scrap (any form), coins. Information free. Wilmot's, 1067D Bridge St., Grand Rapids 4, Michigan.

WATCHMAKERS Tools, materials, supplies, catalog. Catalog, Gates, Box 1000, Chicago 90, Ill.

WATCHMAKER'S—Jewelers supplies, instructions. Catalog 50¢. Bengali's, 10717 Venice, Los Angeles 34, California.

WATCH And clock repairing books. Free catalog. North American, Box 77-AM, Fox River Grove, Illinois 60021.

WEARING APPAREL

TELL The more than 1,400,000 avid readers of Popular Mechanics about your products and services. It costs very little to place your classified message in front of these proven mail order buyers. For further details, write: C. A. Martin, Dept. 66N, Popular Mechanics, 375 Lexington Avenue, New York, New York 10022.



SCIENCE AND CHEMISTRY

ILLUSTRATED Catalog: Chemistry, minerals, biology 25¢. Tracey Laboratories, Evanston, Illinois.

CHEMICALS. Apparatus. Biology. Catalog 25¢. Mid-State Scientific, 7933 N. Clark, Chicago, Ill.

LABORATORY Conversion charts with discounts catalogue—25¢. Hagenow Laboratories, Manitowoc, Wisconsin. 54230.

UNUSUAL Chemistry books, courses, kits! Rare chemicals, cheap! Catalog, 25¢. NISC, Box 94, Redwood City, Calif. 94084.

ROCKETS! Flight kits, testing equipment. Catalog 25¢. Rocket Development Corporation, Route 3, Seymour, Indiana.

AMAZING New book of science experiments, formulas, and catalogue of laboratory supplies. Only 35¢. National Scientific Co., 12 S. Park Avenue, Dept. PM-11, Lombard, Illinois.

SKYROCKETS. Firecrackers, fireworks—Make your own! 60 simple formulas—1.30; 30 smoke formulas, 15 colors \$1.00; 10 fuse formulas 50¢. Paloma Pyrotechnics, Box 247, Auburn 3, California.

CHEMICALS And apparatus for industrial, analytical, and private laboratories. Catalog 35¢. Dept. M-50, Biological Supply Co., 178 Mt. Hope Ave., Rochester 20, N.Y.

300 Page Chemical apparatus catalog, \$2.00. Laboratory Materials, 1330 Hyde Park, Chicago 60615.

25 INEXPENSIVE Libraries in science, technology and general literature. Experts selections from 45,000 paperbacks, 25¢ refundable. Lewin's Library, 1549-P, Burnside, Montreal 25, Canada.

FREE. Science Catalog, Chemicals, glassware, physics, biology. Frey Scientific, 465 S. Diamond, Mansfield 3, Ohio.

EXPENSIBLES Kit offer details, chemistry catalog 25¢. Laboratory Sales, Box 161-A, Brighton 35, Mass.

UNDERWATER Fuse 3/32" diameter, 36 feet, one dollar plus free fireworks, catalogue postpaid. Christy, Box 85, Bergenfield, N.J. 07621.

ROCKETS: New illustrated catalog 25¢. Single and multistage kits, cones, engines, launchers, trackers, technical information, etc. Fast service. Estes Industries, Penrose 7, Colorado.

FIREWORKS: Formulas and detailed procedures for every type with illustrations. \$1.00. R. H. Industries, Todd Lane, Cohasset, Mass.

FIREWORKS Fuse 10 feet, 25¢. Pyro, Box 997, Saratoga, Calif.

ROCKET Catalog and fuse sample, 25¢. Central Rocket, Waupaca, Wisconsin, 54981.

ROCKET-Liquid used, 10 lbs. Payload capability. Complete plan only \$2.98. Missile Research, 517 Elder, Anaheim, Calif.

NEW Science Projects—How magnets grow fast, seed plants, flowers, change genetic types of small animals, plants, vegetables. \$2.00: Laser Gun, instructions, drawings, where to get parts \$2.00; Photograph ultra violet radiations, fall out, no camera needed, 5 special film packs, instructions \$2.00; Build your own, Crime Lab, Hospital Type, (Chemistry Electronic) pH, meter instructions, etc. \$2.00; Gemini 5, Activated Charcoal type, over 300 pieces \$2.00, Albert Roy Davis Research Laboratory, Green Cove Springs, Florida.

UNDERWATER Fuse 3/32" diameter 40 feet with fireworks information, \$1.00 postpaid, 100 feet, \$2.00. Wayne, Box 182, Addison, Mich.

SEARCHING For economically priced chemicals and apparatus? GHT with catalog, 25¢, Starr Scientific, Manitowoc, Wisconsin 54220.

FORMULAS, PLANS, ETC.

FOR Proof of what you can do in specialty manufacturing get our literature. It's free! Miller, Chemist, 1517-P, Tampa, Florida.

OUTSTANDING Encyclopedia of formulas, processes, trade secrets. Free information. Cassill, Box 1535, Eugene, Oregon 97401.

FREE Catalog of formulas, home business and money-making plans galore! No charge, no obligation. Western Chemicals, Box 19718-C, Los Angeles 90019.

LATE. Modern manufacturing formulas. List free. Moon Chemical, Martville, New York.

10,000 MONEY-Making formulas, processes, 900 pages, \$6. Wilson, Box 399, Markham, Ontario.

PROFITABLE Manufacturing formulas. Literature free. Pontoso, 2625 South Eighth, Terre Haute, Indiana.

FORMULAS—All kinds. Amazing big catalog, 10¢. Kemikal, Park Ridge, Ill.

PLASTICS

NEW! Pressure sensitive plastic laminating machine. Supplies. Details. Burr, 7645 Oakland, Kalamazoo, Mich. 49002.

BOXES, Plastic, 200 sizes. Free list. Althor, 2260 Benson Ave., Brooklyn, N.Y.

PLASTIC Lamination on beautiful wood documents, diplomas, certificates, photos, etc. Permanent. No framing necessary. \$2 (Minimum) sq. ft. or less. Free brochure. Macks Plastics, 2625 Bellegarde, St. Louis, Mo. 63113.

PLASTIC Embroiders. Jewelry workers. We have everything. Findings, moulds. New catalog 25¢. David Co., 861 Broad St., Dept. M, Providence 3, R.I.

NEW Liquid casting plastic clear colors. Embled rose flowers, butterflies, photos, coins. Send 25¢ for two handbooks "How to Cast Liquid Plastics" and "How to Make Extra Money at Home." Castolite, Dept. 63-101M, Woodstock, Illinois.

TREASURE FINDERS

POWERFUL Metrotech locators detect gold, silver, coins, relics. Moneyback guarantee, terms. Free information. Underground Explorations, Dept. A, Box 793, Menlo Park, California.

TREASURE-Fone automatic. A new principle in electronic metal detection. Patent Pending, \$129.50. Write: Highlander Co., Dept. 23, 10308 Brenda Way, Rancho Cordova, Calif.

TRANSISTOR Treasure detectors, underwater detectors. Many models. Free catalog. Gardiner Electronics Co., Dept. 9, 4729 N. 7th Avenue, Phoenix, Ariz.

TREASURE Hunters, prospectors, beachcombers; pin-point exact location buried coins, relics, gold, silver with powerful metal locators. Free literature. Write: Goldak, Dept. B-11, 1544 W. Glenoaks, Glendale, California 91201.

TREASURE. Gold, silver, relics. Find them with new 1960 models. Free information. Rayscope, Box 715, North Hollywood, California.

TREASURE. Find gold, silver, relics with a super, powerful detector locators. Free information. Detectron, Dept. 11-PM, P.O. Box 243, San Gabriel, California.

TREASURE Metal detectors most complete line in U.S.A. Free catalog. Bill's Service Center, Box 1, Paramount, California.

COMPLETELY New prospecting technique developed by Relco. New transistor models detect buried gold, silver, coins, treasures. \$19.95 to \$129.50. Write for free catalog and "guide for beginners". Relco-A40, Box 10563, Houston 18, Texas

SAVE! Build transistorized treasure finder. Details free. Del Research, Box 347-B, Alden Manor, Elmont, N.Y.

EXCITING Adventure locating hidden loot, treasure, relics, etc., with powerful, electronic M-Scope locator. Lightweight. Guaranteed. Very easy terms. Send for Free booklet, interesting customer reports. Fisher Research, Dept. AY, Palo Alto, Calif.

"HANDBOOK For Underwater Prospectors." Best book yet on diving for gold. \$3.00, postpaid. "Guide-Kit" Publications, P.O. Box 332, Rialto, California 92376.

NEW Featherweight Metal Detector, fully transistorized, sensitive, earphone and visual gauge. \$148. Pod. M & E Marine, Camden 1, N.J.

OIL Leases: Property Government Registers. Low as \$100.00. Large profits possible without leaving home. Free information, maps. Land Sales Corp., 206-M Bloor W., Toronto 5, Canada.

NEW. Coin locator! Free literature! Howe, 811-C Kansas, Atchison, Kansas.

PRECIOUS STONES AND MINERALS

EARTH Science. Educational magazine. Subscription, \$2.50. Sample, 35¢. Box 550-PM, Downers Grove, Ill. 60515.

GEM Free catalog no serious rockhound, gem cutter, jewelry maker, hobbyist or craftsman can be without. Full of bargains, exclusive items, low prices from largest suppliers and authorities in the field. Free new catalog just off the press, yours for the asking. Write: Weger's, Dept. C-12, 1633 E. Walnut, Pasadena, California.

SEMI-Precious uncut gems. Ten different for \$1.00. Request list 30. Prospectors' Shop, 201 San Francisco, Santa Fe, New Mexico.

JADE Tie tack, rockhound catalogs. \$1.00. Dailey, Box 405C, Driggs, Idaho.

DIAMOND. Guaranteed genuine, natural. \$2.00. Approx. Weight 1/4 carat. C & J Diamond Company, Box 97-M, Plainview, L.I., N.Y. 11803.

20 DIFFERENT Beautifully polished Agates and Jaspers. \$3.00. Phillips, Box 131-P, Banning, Calif.

U.S. AND foreign mineral specimens, lists 10¢. Minerals, Winston, New Mexico 87943.

SPARKLING "Herkimer Diamond" and apatite crystal with our catalog on Gems and Minerals. Send 50¢. T. L. Baskin & Sons, 732 Union Ave., Middlesex, New Jersey.

CARTOONING, COMMERCIAL ART, SHOWCARD & SIGN PRINTING, TATTOOING

How To make money with simple cartoons. Everyone who likes to draw should have this book: Free. Send name, zip code. Cartoonists' Exchange, 911 Pleasant Hill, Ohio 45359.

SIGN Painting, Fascinating system. Straley, 410 South Western, Springfield, Ohio.

SIGN Painting and art. Instructions, brushes, equipment, everything. Free catalogue. Kaufmann Supply, Centertown, Missouri.

YOU Can entertain with chalk talks. Catalog 10¢. Balda the Cartoonist, Oshkosh, Wis.

LEARN Sign painting at home. Free talent test. Ben Kerns, Box 812-PM, Greenville, S.C.

LEARN Profitable magazine cartooning. Free details. Hartman, Box 3097, Lincoln 10, Nebraska.

SAVE \$\$\$\$\$\$ on outdoor signs. We have individual painted letters. Free list. Cee-Jay, Box 33, Beverly Shores, Indiana 46301.

ART Lessons \$6.00 a month. Includes drawing, painting, advertising art, cartooning. Art kits (worth \$25) and materials. Assignments corrected with overlays, by mail, and returned to you. Write for free book. No obligation. Washington School of Art, Studio 148, Fort Washington, L.I., N.Y.

SIGNS Sure-easy method. Ellis, 10533 121 Ave., Largo, Florida.

LIKE To draw? Splendid opportunities in professional cartooning. Write for free catalog. No obligation. National School of Cartooning, Studio-H, Box 8958, Cleveland 36, Ohio.

ADVERTISING AGENCIES, ADV. SERVICE, MAILING LISTS

MAILING Lists most all kinds 1000 \$5.00. Free folder. Your circulars mailed \$4.00 1000. Dixie Mailers, King, N.C.

PENNANTS, Decals, imprinted pencils, pens, coins, book matches. Mieska, Box 918, Brookville, Pa.

OUR Clients' mallorder advertisements in magazines and newspapers must pay. If yours don't, contact John O. Powers Advertising, 116 John, New York 38.

ADVERTISING Ratebook leading newspapers, magazines, free. Chicago Advertising Agency, 28-E Jackson, Chicago 4.

TYPEWRITERS, DUPLICATORS, OFFICE EQUIPMENT

ENVELOPES, Paper, ribbons, stencils, carbons, ink. Catalog. Tower, Lafayette Hill, Pa. 19444.

OFFSET, Letterpresses, varitypers, typewriters, mimeographs, multiphase machines. Bargains. Dixie-Graph, King, North Carolina.

RUBBER STAMPS AND OFFICE SUPPLIES

FREE Catalog: Rubber stamps, printing. Dowling Products, Dept. PMA5, Pitts-town, N.J.

RUBBER Stamps, pocket or indexed 3 lines, \$1.00. Free brochure. Stamps 1214 Williamson St., Burlington, North Carolina.

SIGNATURE Stamp, \$2.88. Three lines. \$1.00. Catalog. Jackson's, 1433 Winnemac, Chicago, Illinois.

SIGNATURE Stamp—\$1.00. Three lines pocket—56¢. Value House, 550-M Fifth Avenue, N.Y.C. 10036.

CHRISTMAS Designs rubber stamps. Free list. Stamps, Box 5711 Denver 17, Colorado.

RUBBER Stamps, marking devices, supplies. Free Catalog. Tabco, Tomkins Cove, New York 10986.

HARD Type for rubber stamp making and printing, free catalog. Barco Type, 237 S. Evergreen, Bensenville, Ill.

FREE 32 Page rubber stamp catalog. Signature stamps \$3.50. Youngers Stamp Shop, Princeton, Iowa.

PRINTING, MULTIGRAPHING, MIMEOGRAPHING, GUMMED LABELS

PRINTING—8 Page catalog—1½¢: 5M 8½ x 11 #1/8, \$15.00. Free price list. Copen, 337 Butler Street, Brooklyn 1, N.Y.

QUALITY Printing: lowest prices. Samples. Dowling Products, Dept. PMA5, Pitts-town, N.J.

100 PRINTED 5½x8½ letterheads and 100 #5 envelopes \$2.75. Price list free. Purple Enterprises, Box 16291-A1, Jacksonville, Florida 32216.

OFFSET Printing postpaid up to fifth zone. 1000 8½x11 20 lbs. bond \$6.00. Write for price list. Biscayne Products, Box 346, New York 5, New York.

FIRST Quality printing—reduced prices. Seico Products, Danvers 37, Massachusetts.

BUSINESS Printing. Catalog Free. Bill's Press, 538-P Leffingwell, Kirkwood, Missouri 63122.

1,000 THERMOGRAPHED (raised letter) business cards, \$3.75. Free samples! Griffin, 322 West State, Ithaca, New York 14850.

1000 EMBOSSED business cards, \$3.25. Dealers wanted! American, Box 165B, N.Y. 10458.

OFFSET Printing—500—8½x11½ \$3.90. Postpaid to 7th Zone. Cisco's Duplicating, Atlanta, Illinois.

NEW Mimeoprinting makes mimeographing obsolete! Quality work, fast service, low rates. Request free 12 page information booklet #8. Seaview Mimeo, 815 Avenue L, Brooklyn, New York 11236.

1966 CALENDAR Back business cards—\$4.50 per 1000—Rayborg, 810 West 18th, Erie, Pa.

NEW Linotype magazines. Pulls, \$120. Spilts, 895, Gardners, Ivyland, Pa. 18974.

BUSINESS Cards 1,000. \$3.85. 2-colors, \$4.90. Wedding Invitations, Raised. Bixler, Bensan Avenue, Frankfort, Kentucky 40601.

OVERNITE Offset printing 1000 8½ x 11½. \$6.50 postage extra. Evergreen, 9420 Trumbull, Chicago 42.

BUSINESS Cards—all kinds. Many samples, cut catalog, 10¢. Pace Card Company, Box 7, Flushing, New York 11352.

BUSINESS Cards thermographed engraved 1,000 \$4.10, postpaid. Goodall, 68-N Joost, San Francisco 94131.

AMAZING Business printing values. Samples. Print Shop, Box 576, Greenville, R.I.

PRINTING & RUBBER STAMP OUTFITS—SUPPLIES

TYPE And supplies for rubber stamp makers. New wholesale price list No. 3 free. Star Stamp Supply, 732 Federal, Chicago 5, Ill.

MAKE Your own self-molding rubber stamps and printing cuts. Flexirubber, Argyle 1, Wisconsin.

RUBBER Stamp presses, hydraulic operated, electrically heated. Sizes 5" x 6", 8" x 12", 10" x 15". Starting outfits, supplies. Printing presses, Type cases and cabinets. Custom Manufacturing, 1464-P East Commercial, Springfield, Missouri.

DO Your own printing. Save money. Simple rules. We supply everything. Print for others: good profit. Raised printing like engraving too. Have home shop. Details free. Kelsey Presses, V-11, Meriden, Connecticut.

90% PROFIT Rubber stamps. Complete outfit. \$89.95. Duckman, Avoca, Ark.

RUBBER Stamp manufacturers supplies. New products. Low prices. Catalog. Jackson Supply, 1433 Winnemac, Chicago, Ill.

NEW Type Catalog No. 11. 96 Pages. Send One Dollar. Deductible First Order. Acme Type, 732 Federal, Chicago, Illinois.

RUBBER Stamp presses, mounts, supplies. Martin, 1425 Major, Jefferson City, Missouri 65101.

NEW Unique rubber stamp press. If you can set type you can make perfect stamps with our patented, \$50 moulding press. Victor Press, Broadway, Raynham, Mass.

RUBBER Stamp outfits, supplies. Kiewit, 2025 Barney Road, Kalamazoo, Mich.

REMAILING SERVICE

PRIVATE Address, information 25¢. Remails 25¢. from Baltimore, Charlotte, Atlanta, Jacksonville, Tampa, Chicago, St. Louis, San Francisco, Mexico City, 85¢. Kensington, Greenville, South Carolina 29609.

OLD Established, 25¢, \$3.00, monthly. DeGraft, Box 14156-P, San Diego, California.

SECRET Receiving and remailing. Discreet and confidential. Remail 25¢ single. 8050 S. Main, Houston, Texas.

SECRET Mail receiving system. Hedgepath, 495-W South Second, Alhambra, California 91802.

LOS ANGELES, Hollywood, San Fernando Valley—25¢ single: \$3.00 monthly. Confidential, 10437 Lanark Street P. Sun Valley, California 91352.

MIAMI Remails, 25¢. Monthly rates. Marie, Box 1266, Coral Gables, Florida.

REMAILS 25¢. \$3.00 monthly. Rodenhiser, 294 Lincoln St., Boston, Mass. 02134.

SOUTH America remailing 25¢. Castrillon, Apartado Aero 1700, Medellin, Colombia.

TOKYO Japan re-airmails, \$1.00. Confidential. Japan postcards available \$3.00 dozen. Kawamoto, 35 Haramachi, Shibuya-ku, Japan.

WASHINGTON, D.C. remails 25¢: \$3.00 monthly. Graham, 1304 Carroll Place, Falls Church, Virginia.

CONFIDENTIAL New York City mail address \$3.00 month. Remails 25¢. Details free. Birnham, 152 W. 42, New York City 36.

METRO N.Y.C. remails, 25¢. \$3.00 monthly. Personalized daily mail service. \$5.00 month. Worldwide, 60-04 Main St., Flushing 55, N.Y.

ITALY Re-airmails. Informations, stationeries, samples free. Capodilupo, C.P. Montesacro, Rome, Italy.

YOUR Christmas cards remailed from Alaska! Details. Frontier, Box 73, Douglas, Alaska.

REMAILS Confidential 25¢. \$3.00 Monthly. Mail-A-Thon Service, P.O. Box 1023, Cornwall, Ont., Canada.

HAWAII Secret unadvertised address. Remails 25¢. Receiving-forwarding, \$3.00 monthly. Postcards. Perfume. Coe Box 984, Kailua, Hawaii 96734.

REPAIRS AND SERVICING

MAILORDER Record Book, 30 pages. Records inquiries, orders, advertising expense, etc. Most complete. Just send dime for postage and handling. C. A. Martin, Popular Mechanics, Dept. BM, 575 Lexington Ave., New York, N.Y. 10022.

SPECIAL SERVICES

FACTS, Any subject—product. Research, surveys, reports, assignments. Information 25¢. Box 1431, Greenville, South Carolina.

ANYTHING You need, we locate for a reasonable fee. NBARS, 9325B Menard, Oaklawn, Ill. 60433.

INEXPENSIVE. You need business publicity. Vantury, 4407 Lamona, Fresno, California 93703.

EYEGLASSES! Wholesale laboratory established 25 years. Mail eyeglasses or prescription for quote. Global Opticians, 16 East 23 St., New York, N.Y.

TOBACCO

MAILORDER Record Book, 30 pages. Records inquiries, orders, advertising expense, etc. Most complete. Just send dime for postage and handling. C. A. Martin, Popular Mechanics, Dept. CM, 575 Lexington Ave., New York, N.Y. 10022.

RAZORS

TERRIFIC Value. Precision electric razor. Swiss-made. Two year guarantee. Reduced. \$9.95. Kayburn, 2024 Webster Ave., N.Y.C., N.Y. 10457.

WANTED—MISCELLANEOUS

MERCURY. Gold. Silver. Platinum: Ores assayed. Wholesale Terminal, Norwood, Mass.

STAMP Collections, accumulations. Eagle Stamp Co., 2221 Romine, Pittsburgh 26, Penna.

PERSONAL

LOANS By mail, \$100-\$1000. Anywhere. Confidential. Write Union Finance, Dept. PM, 222 W. Osborne, P.O. Box 7457, Phoenix, Arizona.

LOW-Cost loans by mail, \$6.00 monthly repays \$104.50: \$56 monthly repays \$1-321.39. Borrow any amount. Guaranteed fast, confidential. Write today! Bankers Investment 67-B, Box 1648, Hutchinson, Kansas 67501.

INVESTIGATORS. Free brochure, latest subminiature electronic surveillance equipment. Ace Electronics, 11500-P NW 7th Ave., Miami, Florida 33168.

BLITZ Reducing! 5 pounds overnight! Guaranteed! Bljou, Box 1727-BM, Hollywood, California 90028.

NEED Money? Borrow \$100-\$1000 by mail. Confidential. Repay in 24 months. Free loan application. World Finance Co., Dept. RW-175, 620 Sykes Bldg., Denver 2, Colo.

DON'T Put off making your will. Two legal forms \$1.00. Laurins, 1137 Second Avenue North, Jacksonville Beach, Florida 32250.

BORROW \$1,233 Airmail! Repay \$54 for twenty-nine months. State licensed Postal Finance, Dept. 17-L, Kansas City, Kansas 66117.

BORROW \$100 to \$1000 by mail. Quick, easy, private. No co-signers. Repay in 36 small monthly payments. For the amount you want write today to Dial Finance Co., 410 Kilpatrick Bldg., Dept. 11-214, Omaha, Nebraska 68102.

25 HOLLYWOOD (Las Vegas) postcards: \$1.00. Retailed Postpress, Box 1069, Hollywood 90028.

OCCULT Supplies and services, catalogue free. "Lodge" Brantridge Forest, Balcombe, Sussex, England.

DON'T Quit smoking until you get free facts on my amazing new kind of pipe. Send name E. A. Carey 1920 Sunnyside, Box C-252-C, Chicago, Illinois 60640.

BIBLE Questions answered. Stamped envelope. Bylon, 17167 Bentler, Detroit, Michigan 48219.

91 FOREIGN Mailorder catalogs from 19 countries! Sources listed in "Overseas Catalog Guide" free. "Overseas," Readville, Massachusetts.

WIPE Out all debts. Get loans, credit. Free details. Counselor Reports, Harlingen 7, Texas.

HOME I.Q. test. Free sample. Test Center, Box 139, Fresh Meadows, N.Y.

SUBCONSCIOUS Conditioning remakes personality while you sleep. Free details. Sleep-Learning, Box 24N, Olympia, Washington.

MISCELLANEOUS

ORNAMENTAL Iron designs. Book of 1600 beautiful, practical designs for railings, columns, etc. Free literature. Cunningham, 388 South 3200 West, Salt Lake City, Utah 84119.

LOANS By mail, \$100-\$1000. Anywhere. Confidential. Write Union Finance, Dept. PM, 222 W. Osborne, P.O. Box 7457, Phoenix, Arizona.

BIRTH Certificates, Marriage Certificates, Diplomas 2 blank forms \$1.00. Sample 100. Standard Forms, Box 482-M, Washington, D.C. 20044.

SUPER Memory overnight! Success guaranteed! Bljou, Box 1727-M, Hollywood 28, California.

FREE Wholesale catalog! 100,000 products. Tremendous discounts! Taylor Distributors, Newton 2, New Jersey.

IMPROVE Your memory. Simplified system. Free details. Laurins, 1137 Second Avenue North, Jacksonville Beach, Florida 32250.

YOUR Name sent to 1000 importers, publishers, mailers, wholesalers, etc. on our mailing list. Year \$1.00. Dixie Mailers, King, N. Car.

CESSPOOLS, Septic tanks, dry wells, clogged drains cleaned by Suroilvent. Saves pumping, digging, etc. Electric Sewer Cleaning Co., Boston, Mass. 02134.

RADIO Announcing. Learn home! Books, magazines, Disk Jockey, Box 11, Aberdeen, South Dakota 57401.

HEARING Aid batteries wholesale. Free list. Habs, Box 51, York, Penna.

BUY From Hong Kong. Color catalog and information, \$2.00. Phillips Drug, P.O. 709, Arkadelphia, Arkansas 71923.

CIGARETTES—Make 20 plain or filter-put for 9¢. Factory-fresh pipe tobacco. Mild tropical flavored Philippine cigars. Free free. Moberly, Box 903, Owensboro, Kentucky.

ANEMOMETER (Electric wind speed indicating system) complete with meter, cable, transmitter and walnut desk stand, plus free rain gauge, \$19.95. Send money order or save shipping charges. Pioneer Sales Co., Box 7151, Dallas, Texas.

BARQAINS Galore! Free illustrated catalog. Thomas, 8905 Mariposa, La Mesa, California.

RECEIVE Gifts, magazines, catalogs, money-making opportunities, 10¢ Directory, Box 500024, Tucson, Arizona 85703.

MEXICAN Feather "paintings" framed 5x7 3 for \$1. Guaranteed. Filipo, 15747A, Paseo Del Campo, San Lorenzo, California.

BURTON'S Mail Order, 4019-A, Finney, St. Louis, Missouri, 72 Unique and useful items. Brochures.

CARVED Conquistador statue, Mexico. Over foot tall, \$5.00. Emporio Internacional, Box 6092, San Diego, Calif. 92106.

FREE Brochure. Suede Tyrolean hat—aged leather. Chester Series Cheese Shop, Box 429, Dept. 57, Monroe, Wis.

HEARING Aid batteries—wholesale. Batteries 4044 W 26th, Chicago 23, Ill.

BOOKS On antiques and their prices. Free circular! P. Warman Publishers, Uniontown, Penna.

Mrs. Jonscher



DEKORATOR SPRAY ALUMINUM...

it's the fast, easy way to decorate for Christmas

Users tell us *Dekorator* aluminum spray paint "works" on every surface from metal to styrofoam. Think what that includes—candles, fruit, rope, wood, paper, foliage, cloth, plastic, glass, Christmas trees, ribbon—and how it simplifies holiday decorating. Made with Alcoa® Pigment, *Dekorator* aluminum spray paint is made by Star Bronze Co., Alliance, Ohio.

Read what one user has to say. Helen C. Jonscher, prominent in Washington, D.C., club and charitable activities, writes, "I've found *Dekorator* aluminum spray paint to be completely versatile in many utility and decorative uses, both around the home and in the performance of committee work at clubs, church and hospital. Now, with the holidays upon us, *Dekorator Spray* will play a big role in preparing seasonal decorations of floral arrangements, styrofoam, etc."

Get a can today. You'll like it, too. Aluminum paint has great hiding power; it goes a long way. One coat covers even soiled or stained surfaces

(aluminum pigment is opaque). Aluminum paint is always bright and attractive; it looks clean—it's easy to keep clean. *Alcoa does not make aluminum paint*, but Alcoa Pigments are used in the best brands. Ask your dealer.

Aluminum Company of America
895-L, Alcoa Building, Pittsburgh, Pa. 15219
Please send free booklet, *Painting With Aluminum*.

Name
Address
City State Code

Alcoa Brings You Action Drama At Its Best
... "THE FBI," Sunday Evenings, ABC-TV



ALCOA

Only full-size car with front wheel drive makes its debut!

 Talk about rare breeds—you're looking at one: new Toronado by Oldsmobile. One-of-a-kind handling with front wheel drive to put the traction where the action is. One-of-a-kind performance from a 385-hp Toronado Rocket V-8 and a specially tailored Turbo Hydra-Matic. One-of-a-kind comfort (for six, mind you) a la



flat floors, draft-free ventilation and torsion-bar-leaf-spring ride. One-of-a-kind convenience from such niceties as concealed headlamps and flat-floored

What makes Toronado tick?

■ 425-cube Toronado Rocket V-8 with Quadrajet Carb delivers 385 hp, 475 lb.-ft. torque, 10.5-to-1 ratio. ■ Newly designed Turbo Hydra-Matic features variable-vane torque converter. ■ All-new low-friction planetary differential is exclusive Olds design. ■ Front drive shafts are equipped with twin, constant-velocity universal joints for smooth power flow. ■ Burly wheels with 8.85 x 15-inch tires, pull (not push) Toronado through turns and over rugged terrain. ■ Rear leaf spring, plus two vertical and two horizontal rear shock absorbers help give Toronado a firm yet comfortable ride.

Oldsmobile Division • General Motors Corp.



trunk. And (rather obviously) one-of-a-kind style, too! Why not stop in to see your one-of-a-kind Oldsmobile Dealer! **LOOK TO OLDS FOR THE NEW!**

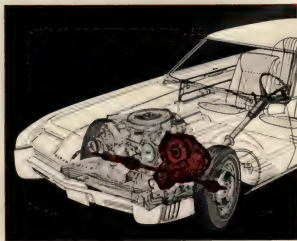
VITAL STATISTICS

Wheelbase	119"
Overall length	211"
Overall width	78.5"
Overall height	52.8"
Curb weight	4496 lbs.

Standard Equipment: Turbo Hydra-Matic • Power Steering • Power Brakes • Deluxe Steering Wheel • Foam-Padded Front Seat • Parking Brake Lamp • Carpeting • Clock • Heater-Defroster • Front and Rear Seat Belts • Padded Instrument Panel • Padded Sun Visors • Glare-reducing Two-speed Wipers • Windshield Washers • Outside Mirror • Directional Signals • Back-up Lamps

*STEP
OUT FRONT
IN '66...*

in a Rocket Action Olds!



TORONADO

New one-of-kind car
engineered by Oldsmobile!



Did we goof by making FORD No.1 in Pickup ride?

That is, are we risking our pickup's hard-earned reputation for ruggedness by giving it the smoothest ride going?

Not at all. Twin-I-Beam suspension is our insurance.

It works like this . . . each front wheel has its own axle—a forged steel I-beam, like big truck I-beams. They work independently, so that shocks at one wheel don't get passed to the other. Or to the driver.

Ford also puts husky I-beam radius rods up front to hold wheel alignment and reduce tire wear.



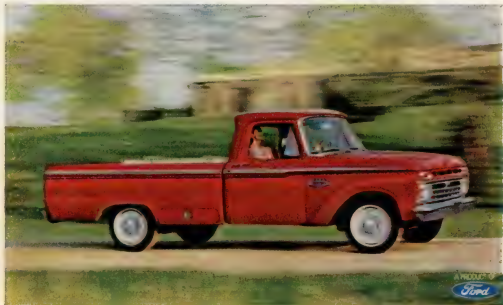
Together, they make an independent suspension that no other pickup can match for smoothness . . . toughness.

Engines are smoother, too. Two big new, seven-main-bearing Sixes have such performance, we had to develop a new V-8 to stay ahead of them.

So are we worried? Not when our biggest concern is building enough to meet the demand. So far this year our sales are up eighteen percent.

Come on in and check us out. Action-test a new Ford today.

FORD/66



EDITOR'S PAGE

New faces on the PM staff

If you've noticed a little tidying up of *Popular Mechanics'* appearance, the broom was wielded by **Raymond A. Schulze**, our new art director. Ray came to us from Hayden Publishing Co., where he also wielded an effective broom. His work has brought him a N.Y. Photo Engraver's design award and plaudits for his revamping of a whole string of magazines: *Media/scope*, *Electronic Design*, *Electronic Week*, *Electronic Daily*. He is 31 years old, lives in New York, schooled at Cooper Union. "Graphics are the means to an end," he says. "The key to ease of communications." That's his goal at *PM*. . . . Our automotive



editors have had a tough time explaining to their wives why they were running back and forth to Detroit like tired commuters. Our new Detroit auto editor, **James Dunne**, will make the ladies happier—and us, too. He's an old hand in the auto center's "backstage," where he dug up inside stories for *Automotive Industries* magazine as its midwest editor. Jim is known in the field as a solid "insider," has produced an impressive array of stories on new-car testing, manufacture and development. He's 34, a graduate of Detroit U., is married and an Army veteran. He's a fast-moving traveler. You'll see some samples soon. . . . Staying on top of developments in the home-building field is a king-size job.



Richard L. Howe, 37, is the new building and housing editor who will do it for us. Dick comes to us with ten years' background in our own field as a topflight "how-to" editor. Before that, he rewrote essays for Nobel Prize-winning scientists, so **people** could understand them. He attended Western Reserve University, then satisfied a wanderlust in the maritime service. Nowadays, as he puts it, he "shares three children, a dog, a cat and a turtle" with his wife—in a Nyack home.



THE MISSING LINK IN TRANSPORTATION

It's ridiculous to put a bulky passenger car on the road just to carry one person, contends this designer. His goal: Build a practical small car

By Jay Doblin



PM'S OWN SUBURBA-CAR is one way of providing that "missing link" in transportation. Two of the author's students at the Illinois Institute of Technology designed the chassis, using a Honda motorcycle engine for power. The author then created this model as a possible body design. If you have other notions about the way it should look, see page 88 for instructions on entering PM's Suburba-Car design contest

KENNEDY EXPRESSWAY, Chicago's major suburban artery, has a rush-hour name. It is called, by the natives who use it, "America's longest parking lot."

This is a pretty state of affairs—especially in the Land of Lincoln where loyalty to accomplishments and "things" usually is so intense that it borders on intramural nationalism.

Yet the sarcasm directed at this new giant expressway, leaping across the swarming midwestern megalopolis with seven-league strides, reflects a burgeoning problem in nearly every major American city. It is the price we are paying for the four-wheeled dinosaur (often two or three) in every garage. Each new car model year, instead of solving the problem, complicates it as cars grow longer, wider, more powerful and unwieldy.

At present, the average car needs about 300 square feet of space—whereas the average person uses less than 100 square feet for any given activity (shopping or dining, for example). This means that three times as much precious space must be provided for parking and roads as for the activity that leads a driver onto the highways in the first place.

Aerial views of Los Angeles reveal that no less than 70 percent of the city area has been devoted to streets and parking.

Now, you are guessing that I am about to make the dire forecast that the king-size luxury car is doomed. Not so. There is a place for the family bus—and, indeed, a real need for it. But it is also becoming perfectly clear that we must have smaller cars.

There are three factors forcing us in this direction. The first is our trend to urbanization; population density continu-



ABOUT AS TINY as an enclosed vehicle can be, this three-wheeler carries one person. All vehicles shown here were designed by students at the Illinois Institute of Technology in Chicago



POWER CHAIR, propelled by 4½-hp four-cycle engine, was designed to be driven to station, transported by rapid-transit train, then driven to office. It occupies 15 square feet of space



FOUR-PASSENGER AUTO is powered by two-cylinder Toyota engine with front-wheel drive. Rear passengers face back and enter through rear door. It's almost two feet shorter than a VW

ABOUT THE AUTHOR: Jay Dublin was director of the Institute of Design, Illinois Institute of Technology, from 1955 to 1964, is now a professor there. He graduated with honors from Pratt Institute in 1942, was with Raymond Loewy Associates from 1942 to 1955



SPARKY is an electrically powered urban runabout. It can go 30 mph—and 60 miles on a charge. There are only three controls: an aircraft-type steering yoke, accelerator and brake. The rear deck can carry 800 pounds



STUDENT'S EFFORTS have been concentrated on designing small vehicles that will take up little space but will still serve as adequate personal transportation.

Relationship of one student design to current automobiles is illustrated in graph. At left is a 17½-foot-long 1965 Chevrolet. In the center is the 13½-

ally goes up. Second, there are more cars per capita. Over the last 30 years we have progressed from one-car families to two-car families, and there are now many three-car families. We are fast approaching the time when there may be one automobile for every adult. Third, there's the rapid increase in population.

All this indicates the need for smaller cars as an interim remedy to prevent the breakdown of urban traffic.

There's just too great a gap between the pedestrian and today's automobile. Americans seem to regard anything beyond three-eighths of a mile as too far to walk, so they hop in the family juggernaut when the urge to be somewhere else hits them. (And it's ridiculous to see a 4000-pound, 300-hp vehicle moving a 100-pound housewife and a bag of groceries at 25 mph.)

Some of the sleekest small vehicles I've seen are those designed by students at the Institute of Design of Illinois Institute of Technology.

One student, Louis Richards, attempting to determine how tiny a personal vehicle could be—how to “motorize a pedestrian,” as he put it—built the Skeeter several years back (see photo, page 87). In fact, he built four of the vehicles, which rather resemble the currently popular motorized skateboards.

The various Skeeters ranged from a 12-pound vehicle with a model airplane engine that could propel a man 12 mph to an 18-pound machine with a half-hp engine that would zip along at 20 mph.

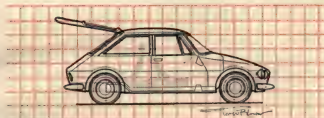
Another student, Makato Kamegawa, built a four-passenger car nearly two feet shorter than the familiar Volkswagen. The car is powered by a two-cylinder Toyota engine and has front-wheel drive.

The two passengers in the rear enter through a rear door and seat facing backwards. The rear seat folds up so that the back of the car can be used to carry freight.

Two other students designed the chassis



SPARKY'S CAB opens like a clamshell for walk-in entry. Rear deck has fold-down seat for extra passengers. The entire vehicle weighs 1000 pounds



foot-long Volkswagen 1200. And at right is a 12-foot car designed by a student at the Institute of Design (also shown in the photo at bottom of page 85)

for the Suburba-Car, a neat little three-wheeler that's great for buzzing off to the store for groceries or for a commuter's lift to the station. The designers, Alan Flowers and Brian Skogler, powered the car with a Honda motorcycle engine that takes it up to 60 mph.

As for the body of this car, there are dozens of ways to complete it. You can try a version and enter it in *PM's* body design contest (page 88). I completed one version in miniature (page 84) that illustrates how the Suburba-Car could be made into a sort of miniature station wagon with a tailgate for loading groceries.

These small vehicles can be divided—rather simply—into two groups: those with weather protection and those without.

Those without protection have the virtue of being simple and inexpensive, but in the United States you might just as well suggest riding a horse. Bicycles, scooters

(Please turn to page 254)



SKEETER is a study in how tiny a personal vehicle can be. Steered by leaning, it's powered by a half-hp industrial engine. Top speed is 20 mph. Handle of the 18-pound machine folds down for carrying



CHARIOT steers by a handlebar that rotates 360 degrees, giving reverse without gear change. The small vehicle is capable of 25 mph speeds and can be driven on rough surfaces because of large wheels

DESIGN A BODY FOR THE

Win This

HOW would you like to be the lucky guy to own this one-of-a-kind Suburban Car? You'll find it the hottest thing on three wheels for scooting about the neighborhood. Your wife can use it for picking up groceries, running errands, carting the youngster to school. And you could be the envy of fellow commuters in breezing up to catch the 8:05.

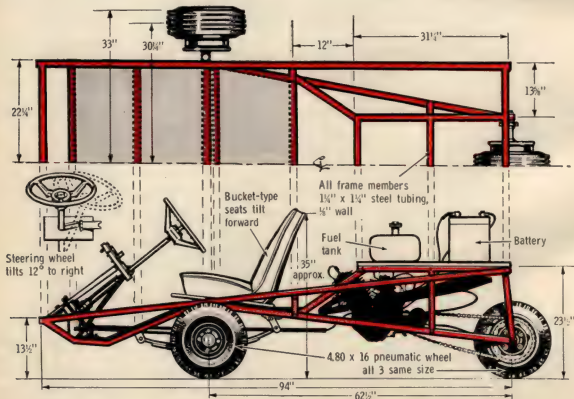
Equipped with a fine Honda engine, this sporty two-seater will stretch a gallon of gas like a rubber band, and it can dart in and out of parking spots like a rabbit.

How do you win it? Simple—you design a body for it and submit your design to PM Suburba-Car Contest, 575 Lexington Ave., New York, N. Y. 10022, postmarked no later than Dec. 20, 1965. There's nothing to buy; nothing to build. If judges select your design as best, the powered chassis shown at right and on the cover, will be shipped to you lock, stock and barrel, just

as it appears in the photo (minus briefcase and umbrella). Then you can add your own prize-winning body and sport the coolest puddlejumper in town.

You need not be an artist or designer to win. The quality of the drawings you enter will *not* be a factor in the judging. Your entry, however, must be shown in drawings to a scale of 1 inch equals 1 foot. The drawings must include a side, front, rear and top view of the body you design, fitted to the dimensions of the chassis shown below. The materials you plan to use must be indicated on the drawings, and you should label any special features.

You may also attach a written description of your Suburba-Car body and may submit a model, if you wish, to help the judges interpret your design. However, such additional material is not essential. *Only the design itself will be considered in the judging.*



PM SUBURBA-CAR AND Chassis!



Entries will be judged as follows:

1 Appearance. Your Suburba-Car should draw admiring attention wherever it goes. You may give it sleek sports-car lines, or the conservative lines of a small family car. You may want to make it look like a beetle, a bus or a tear-drop. In any case, the lines must be pleasing to the eye. Your design may soon be parked in *your* driveway and you'll want to be proud to have it there.

2 Utility. The chassis has been designed, in overall size, to carry two persons and two large bags of groceries. Does your body design take full advantage of this chassis space? Have you provided easy access to the storage compartment such as the body provides on the vehicle shown on page 84? Are your doors of adequate size, and so placed that members of your family won't have to be contortionists to get in and out of your dream Suburba-Car?

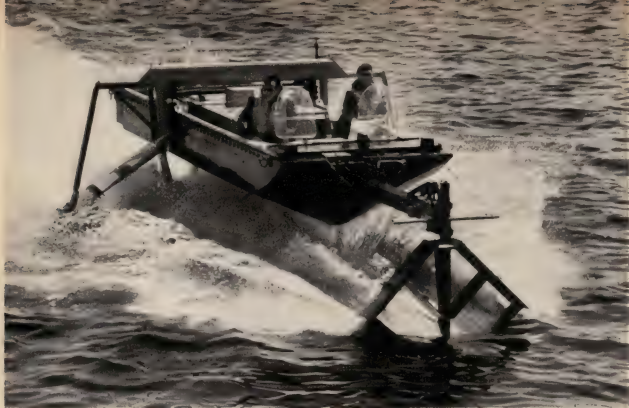
3 Ease of construction. If you win, remember you'll be building your win-

ning design yourself. So the materials you specify should be readily available and adaptable to your design. Where compound curves are involved, you may wish to suggest Plyfoam as a material, after reading our exclusive report on page 146. *But you are not limited to any one material.* The judges also will consider whether your entry can be built with the tools (including power tools) that can be found in a well-equipped home workshop, so don't plan on using a commercial shop.

4 Safety. In most states a car must have the following equipment as a minimum: safety-glass windshield, tail-lights, headlights, brake lights, turn signals and wipers. Don't overlook them. They can be found in most auto-supply stores and may be specified in your design.

5 Economy. No limit is set on cost of building your design. But, judges will take into consideration the estimated cost of your completed Suburba-Car in

(Please turn to page 242)



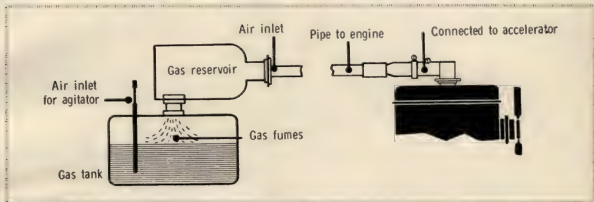
Two-Man Boat Tests Hydrofoils

Designed to accept a variety of hydrofoil configurations, the Royal Canadian Navy's Rx test vehicle is a highly instrumented, 25-foot vessel that carries a two-man crew. It's built of fibreglassed marine plywood. Information from tests is being used in development of a 200-ton RCN anti-submarine hydrofoil ship which will cruise at over 55 mph.



Traveling Golf Clubs Under Par—Weightwise

Taking a set of golf clubs on a trip is no longer a problem of bulk and weight. Porto-club has only one handle, which fits eight clubs. The complete set weighs only 7½ pounds and the carrying bag is the size of an attache case. Clubs and case cost \$120 from MS&R Inc., Irwin, Pa.



Engine Gulps Gas Without a Carburetor

This fuel system needs no carburetor, fuel pump or copper line. Inventor William Scott, a self-taught London engineer, uses a variation of the old system where the engine sucks vapor directly from the gas tank. The large filler tube, open to let

air enter, extends to the bottom of the tank. Suction draws in air, which agitates and vaporizes the fuel.

The photo at upper left shows the vapor intake leading to the engine; at upper right is the bottle that serves as vapor tank.



Marine Band for Cars

Using a simple plug-in convertor, you can receive ship-to-ship and ship-to-shore broadcasts on your present car radio. Price is \$19.95; Hartman Marine Equipment Corp., Long Island City 1, N.Y.



Tethered Pigeon

Carrying a small radio on its back, a pigeon flies at the end of a fishing line and sends back signals of its heart rate, wing beat and breath rate. The bird is in a Canadian research project.

Tape Home Movies

No more film processing. View your pictures immediately after you take them with a new kind of tape recorder

By Larry Steckler



I SWITCHED ON THE LIGHTS, aimed and focused the camera, pushed the record button and shouted "Action"! Gail, my 3-year-old daughter, cavorted about the room—climbing over the couch, crawling under the ottoman and trying (but not succeeding) to stand on her head—until she collapsed in a wriggling heap on the living room floor.

A push on the stop button and I had just completed making my first home videotape.

Minutes later my wife and I were comfortably settled down before the TV screen. A slight pressure on the playback button, and there was Gail again—over the couch, under the ottoman and trying to stand on her head—this time on the TV screen. And the action was accompanied by all the grunts, screams and laughter that were part of the original action.

This was my first journey away from the familiar world of home movies on optical film and into the wonderful new world

for Your TV Screen



of home movies electronically recorded on magnetic tape.

First impressions? I can't wait to get a recorder of my own. I'll use it for all my movie-taking—oops, TV taping. Reproduction is sharp and clear. "Film" costs are less than for 8-mm color film, figuring about \$4 per 50-foot roll. No processing is required and there is positively no waste. If I'm not satisfied with the pictures I'll know it a few minutes later and can reshoot immediately.

I've tried out two of the newest home machines—the Ampex HVR videotape recorder and the Sony TCV-2010 Videorecorder. Both are excellent. The Sony recorder is a complete package with a built-in monitor that is as portable as the muscles capable of trundling its 70-pound bulk to the nearest a.c. outlet. The Ampex recorder must be hooked up to an existing TV at a cost of about \$25. This obviously reduces its portability unless you hook it to a small screen portable TV.

Prices are high, at least for most consumers. The cheapest Ampex set is \$1095 and to this you must add \$529 for a TV camera; bringing the total to \$1624. This does not include the TV receiver to which the set must be connected.

The least expensive Sony is \$995 and includes a compact built-in 9-inch TV receiver. The camera goes for an additional \$400 bringing the total cost to about \$1400. These figures should drop rapidly with the imminent arrival of competition from RCA, Panovision and Norelco (Phillips). But even at current prices the system isn't much more than a top quality 16-mm sound film system.

Just how much impact these machines can be expected to have on the home movie market is aptly summed up by PM's *Midwestern Editor*, Clifford Hicks. Reporting from his Chicago headquarters, Cliff comments: "I'm convinced that this is the coming thing. While the machines are designed for recording TV programs off the air, most people like myself probably couldn't care less about recording the *Munsters* or *My Three Sons*.

"But I *do* care about recording the activities of *my* three sons. I can now do it cheaply, without worrying about exposure levels and other camera problems. I don't have to send in films to be processed; I don't have to darken a room, set up a screen, get out a projector, thread it and end up with a picture (in most cases without sound).

"I can take a picture of Grandma while she's visiting, and show it to her while she's still there."

Most experts familiar with the new system fully agree with Cliff, and believe that it will be only a short time before TV

tape takes over home movies. A good educated guess? Less than five years.

What makes tape so good? There are many reasons, but here are the important ones:

- An hour's worth of tape costs a trifle less than an equivalent length of 8-mm film and much less than 8-mm sound film.

- Taped pictures include sound—at no extra cost, without any additional equipment required.

- An hour's worth of video tape fits on a 7-inch reel. Two hours fit a 9½-inch reel.

- Pictures cannot fade or distort with storage as long as the tape is protected against magnetic fields. There are no color dyes that might be affected by light.

- You don't need a lightmeter. Simply adjust the lens aperture until the picture on the TV monitor looks good; then start taping.

- Rotating heads that sweep across the tape vertically while it runs through the recorder, give an effective tape speed of about 1000 inches per second (i.p.s.), providing good picture quality, yet reducing tape consumption.

- There is no film to be processed. As with a sound recorder, you simply rewind the play back.

- There are no bad pictures or wasted tape. As well as having precise control before starting to tape, if pictures should



COMPLETE HOME MOVIE setup comes in two pieces. One is a compact Ampex TV camera; the other is the video tape recorder. TV set is the viewing screen

happen not to come out right (too dark, too light, Aunt Bertha's head covered up) just rewind the tape and re-record. You can't do that with film.

There are disadvantages too. They will be eliminated, but it will take time. Here are some of them:

- There are no standards. Sony and Ampex systems, for example, are not compatible. The Sony system uses a half-inch tape which runs at 7½ i.p.s. Ampex uses a one-inch tape at 9.6 or 4.8 i.p.s. you can't

AMPEX CONSOLE UNIT, for living-room use, combines large-screen TV with new TV tape recorder



play a tape made on the Sony machine on an Ampex unit and vice versa. Some day though industry-wide standards will be set, just as they were for audio tape recorders.

- No color yet. Present systems record only in black-and-white. They will record color broadcasts, but will play them back only in black and white. The Ampex system is compatible with and can be converted to color by adding some special electronic circuitry at additional cost. It should be available some time in the future. The Sony system cannot ever be used for color unless major technical changes are made in its circuits.

- You must have a.c. power for both TV camera and recorder. This prevents taking pictures on a summer picnic, beach party or vacation trip, unless you have an extra-long extension cord.

This won't remain a problem for long. Power packs that operate from a 12-volt car battery or portable power supply are in the works. There is also news of a miniature camera, battery powered, that records for playback as soon as you get back home.

Sony recorders are available now. According to salespeople at several local appliance stores, they can't wait to get them into stock. Despite the relatively high prices, they feel that sales will really take off.

Initial production will be limited and Sony already has sold its entire production for this year. You may still be able to find an occasional recorder at a local dealer, however. Service will be provided through Sony service centers.

Ampex machines will become available this January in 10 areas of the United States, where Ampex will have established service trucks to install and troubleshoot their sets.

Both machines can tape programs off the air. This can be handy when two good shows are on at the same time or if you won't be home, but would like to catch a particular show.

This may lead to a whole new way of rating TV shows. When the rating service calls they'll have to ask—"What show are you watching?" Then—"What show are you taping?"

TV tape recorders may get off to a slow start. But you may find one in your home before long.

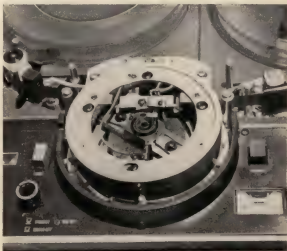
★★★



THREADING THE TAPE on the Ampex video recorder is much the same as threading a conventional audio recorder. Tape width might catch your eye though

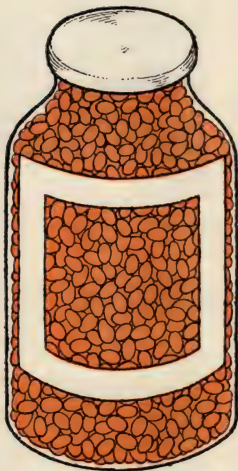


SONY TAPE DECK up close. Controls are simple and easy to use. Operation consists of throwing a panel switch to select record or playback mode



TAPE HEAD COVER removed to reveal the rotating, two-head arrangement that Sony uses. As the heads rotate they are automatically switched into use

How many beans in the jar?



By Edward O. Thorp
Professor of Mathematics
New Mexico State University

The author, who precipitated rule changes at the "21" tables in Las Vegas when his wizardry at math "beat the house," tells how you can "outguess" an old game. All the formulas needed are here. Good luck!

SOME TIME AGO, the papers reported that three college students used their mathematical knowledge to win a guessing game. They estimated the volume of oil in a tank and walked away with the top prizes, worth a total of \$1800.

Though the prizes were unusual—unusually generous, at any rate—the game itself was as old as the hills. At one time or another, most of us have tried guessing the number of nickels in a bottle, jelly beans in a fishbowl or beans in a jar.

As the college boys demonstrated, with a little know-how you can "out-guess" a guessing game of this kind. To keep things simple, I'll limit the discussion to beans.

The obvious solution to the problem is to get the same kind of jar and the same kind of beans as used in the contest. Fill your jar with beans to the same height as the contest jar. Then count the beans. Do you think you'll get the correct number? Chances are that you won't.

How Errors Creep In

First, there may be a small error due to a slight difference in size between the two jars. This error is probably too small to matter but if you are worried about it, you can get several jars and figure out how much they vary. You can do this by filling each with beans and counting. A quicker and more accurate way is to fill each jar to the proper height with water and compare the amounts of water each holds.

A second reason your answer may be off is that beans are of varying sizes and shapes. As a result, the

number in a given volume will vary somewhat. To get an idea of this fluctuation, fill the same jar several times, always with different beans, and count the number in each case. If the jar is large and counting the beans is impractical, do the same thing with a smaller jar. This will give you an idea of the variation in the big jar.

Suppose, for example, that the contest jar is 70 quarts and you use a one-quart jar. If the quart jar gives numbers like 980, 1000 and 1020, then you'd expect that the big jar, which is 70 times larger, to give numbers like 70×980 , 70×1000 and 70×1020 .

Uncertainty in the closeness of packing causes a third error. If you fill a sugar canister and then shake it from side to side, the sugar will settle and more may be added. The beans, like the sugar particles, can be packed closer together by shaking the jar.

One way to get an estimate of this "packing factor" is to count the number of beans that touch the inside of the contest jar and the number touching the inner surface of your own jar. These two figures will give you a ratio or packing factor.

But there may be just too darn many beans to count. You can simplify the task by marking off an area or "window" of known size and shape—a square works best—on the side of the contest jar. Count the beans touching the side of the jar within this area. Do exactly the same thing with an identical window on the side of your own jar.

Let's say that the number of beans seen through the contest jar's window is C and the number seen through the window on your jar is W . Since lengths behave like square roots of areas (the length of the side of a square equals the square root of the area of the square), it follows that the average center to center spacing of beans in the contest jar is approximately $\sqrt{C/W}$ times as great as it is in your jar. You can get the square root of C/W from mathematics tables or a slide rule.

Volumes behave like cubes of lengths and from this it follows that the number of beans in the contest

jar is the cube $(\sqrt{C/W})^3$ times as great as it is in your jar. (The cube, N^3 , of a number N is $N \times N \times N$; the cube of 2, for example, is $2 \times 2 \times 2$ or 8).

Switch to Small Jar

If the container is very large and it is impractical for you to count the beans (the contest sponsors may have a machine to do it for them), take a smaller container and fill it with beans. Count the beans. Then see how many of these smaller jars are needed to fill the big jar. Multiply to get the total number in the big jar. To get an idea of the error involved, try the method several times and note the "spread" in the results.

Suppose a jar like the contest jar can't be obtained. Then we can proceed by estimating the volume of the

(Please turn to page 206)



Drawings by Alice Golden



Stadium Built Like a Tinkertoy

It took skiers and boat drivers at the Cypress Gardens, Fla., water show only 10 days to construct this aluminum and steel "photo" stadium. The structure came in kit form—13,000 identical struts, 3000 identical joints and 33,000 bolts—and required only small power wrenches for assembly. The components were made by Up-Right Scaffolds, Berkeley, Calif.



Have a Soda—on Credit

A new credit card for vending machines ends the search for proper denomination coins. Insert the card, select the desired item—and you'll be billed later. The Automatic Canteen machines also take coins.

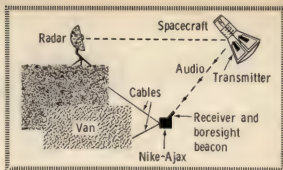


Infrared Fire Spotter

Incipient forest fires are spotted by an externally mounted infrared scanner that senses heat sources and simultaneously takes a continuous strip of pictures of the ground from altitudes up to 4000 feet.

Astronaut to Talk by Laser

During the Gemini-7 orbital mission next year, Astronaut James A. Lovell will try to talk by laser beam with colleagues stationed at White Sands, N.M. He will wear protective glasses when he aims the laser transmitter, as demonstrated below, through window of the space craft at a beacon on the ground. Communications system to be used is diagrammed at right.



Volkswagen Will Introduce Fastback Sedan

A fastback sedan, powered by a 65-hp, air-cooled rear engine, will debut in Volkswagen's 1966 lineup. The car has front disc brakes, four-wheel independent suspension, and carries five passengers. A second version of the car, a station wagon, will appear at the same time.

New deal for the harried commuter

Silent, rubber-tired trains are being built for today's travelers—and 2000-mph pneumatic subways are on drawing boards for tomorrow

By Alfred Williams



"I'LL BE ALONG IN A MINUTE," Dixie Howell said in his North Carolina drawl. "Meanwhile, let's look at the tracks."

We moved to the edge of the platform and J. Kendall Howell, project engineer on a revolutionary new concept of transportation, described with a professional's pride what it's all about.

"It's silent, or about as silent as you can get. It's automatic. There's no motorman. And it's definitely a rapid-transit system. It has its own roadway."

He pointed to the cement tracks.

"That's new. The trains run on rubber tires, so we've eliminated the noise and weight of metal wheels and metal rails.

"The middle rail is simply an I-beam used as a guide rail. Smaller rubber wheels, mounted horizontally, ride the slots to keep the train on the track.

"On one side the antenna picks up command signals to start and stop the train and open and close the doors, and on the other side three trolley wires furnish the power. This three-phase system is more efficient than the old single trolley."

Howell pointed to a building behind us. "It's all controlled from in here.

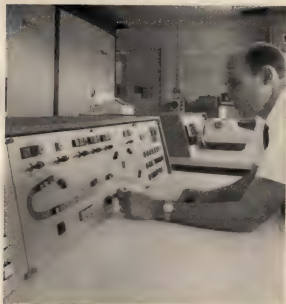
On an operational system we'll have wayside controllers that, through computers, will instantaneously control all trains within their area, speeding them up, slowing them down, spacing them.

"But, let's take a ride."

I turned around again and was shocked. The car was standing there. It had rolled up unnoticed on its silent rubber wheels.

Inside, in airconditioned comfort, Howell explained what to expect.

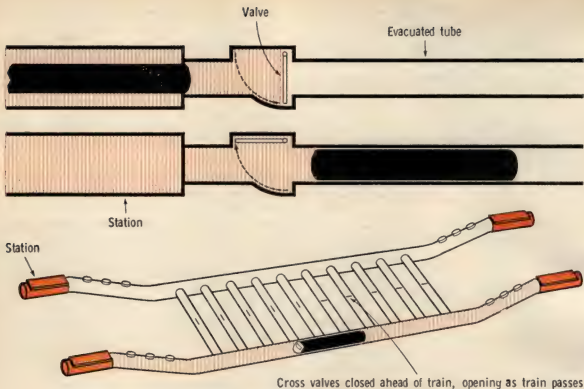
"The windows are see-through mirrors, glare-cutting from the inside and opaque from the outside. We've got seats," he said, patting the cushion beside him, "for 28,



RUBBER-TIRED TRAIN (left) will be controlled by computers (above) from wayside stations, giving passengers silent and automated ride without motorman



PITTSBURGH TRAIN is held on track by small guide wheels that ride center I-beam. Antenna (left) picks up signals and trolleys (right) furnish power



PNEUMATIC-TUBE TRAIN borrows principle of department-store tubes. Stations are at atmospheric pressure, while tubes are near vacuums. When valve opens, pressure pushes train into tube and accelerates it at controlled rates. As train condenses air in front of it, eventually equalizing air before and behind it, it begins to decelerate. Acceleration and deceleration valves, plus cross valves, help control amount of pressure in tube



DR. FOA'S TUBE TRAIN uses another principle, pulling air from in front of vehicle and pushing it out behind without appreciably disturbing air's stability



SAN FRANCISCO TRAIN, already being built, will carry motorman, but only to monitor automated system. Ten-car trains will be computer-controlled

with standing room for 42 more in each car, and we can link up to 10 or 12 cars together for rush-hour traffic."

While he was talking the car, eerily, began moving. There was no driver. In fact, there was no room for one.

"All the electronics gear is in the end walls," Howell said. "That drives it."

All I could hear was a hum, and an occasional click-clack when the guide wheels passed the juncture of two I-beams that weren't aligned properly. The ride around the two-mile twisting track, while remarkably silent, wasn't noticeably smoother than a New York subway.

"I think when we make smoother bends in those I-beams on the curves, we'll solve some of our problems."

The ride took us around Pittsburgh's South Park, where Westinghouse Electric Corp., with its own and federal, state and local funds, built the prototype of its transit expressway. We moved from ground level to elevated tracks supported by single pillars.

"The single pillars take up less space than old elevated systems. In fact, along one stretch here," he pointed out the window, "a double track is supported by single pillars. We could set this up in the

center of almost any street without disrupting too much ground traffic, or along the center island of an expressway."

Pittsburgh, which has no rapid-transit system, may be Westinghouse's first customer, although queries have come in from all over the world.

The Pittsburgh test, however, while much further into the hardware stage, is just one of many new and novel concepts for moving people from one place to another. The coming revolution was born in necessity. Except for aviation, which developed jets and is now working on a supersonic transport and vertical takeoff-and-landing aircraft, no improvement in ground or water transportation has taken place in half a century.

Now, within our lifetime, we may see jet-powered automated trains that will skim along on a cushion of air at 200 mph, passenger-carrying capsules that will rocket from coast to coast through tubes at 2000 mph, and hydrofoil passenger ships that will cross the ocean at 100 mph.

Even President Johnson, when he asked for studies of "high-speed rail transportation," indirectly endorsed the criticism that present systems are becoming obsolete.

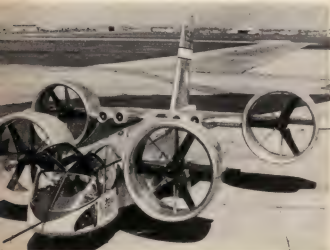
Perhaps the first rail system to "get off



HYDROFOIL LINERS, once a novelty, are now in daily commercial use in all parts of the world. Navy and Maritime commission are experimenting with models that may carry military or commercial passengers at 115 knots



BOSTON-WASHINGTON TRAIN, asked by President Johnson, may be something like this model proposed by Budd Co. Makers say it could go up to 160 mph



UNIQUE VTOLS, aircraft that go straight up and straight down, could relieve congestion around airports by taking off and landing in downtown areas

the ground" will be in the San Francisco Bay area where work has already started on an automated (no-driver) system.

"The control system must stop trains within six inches of a given spot," B. R. Stokes, general manager, told our man on the West Coast. "It must operate all functions—starting, stopping, accelerating, decelerating and opening and closing doors—during peak rush hours, when 450 cars in various train lengths will be operating at speeds up to 80 mph and as close as 90 seconds apart."

Darrell Halligan, manager of the test track operation, took our man out to the track where a model car has been put through its paces. "We plan 20-second station stops, and hope to carry 30,000 seated passengers an hour in each direction."

Seated passengers?

"Seated. We hope to operate enough

trains frequently enough so no one need stand. Our average speed will be 40 to 50 mph, including station stops, twice as fast as any existing rail transit system."

In spite of automation, seated comfort and all the rest, the San Francisco system is only a short first step in the direction some transportation planners are thinking.

A British inventor, Christopher Cockerell, for example, has built a six-ton model "Hovertrain" with a 240-hp jet engine to blast it into a hovering position a half-inch from vertical and horizontal surfaces of a T-shaped concrete "rail." From that position, even a child's push can send it skimming frictionlessly over the rail. With jet power or a linear induction motor, which has no moving parts, such a train easily could travel 400 mph, he claims.

Studies at the Massachusetts Institute of Technology are exploring several high-speed railway concepts. One futuristic system might shift passengers from one moving train to another in large capsules, allowing transfers from express to local trains, without slowing either.

"Control problems will be critical, demanding which mechanisms and techniques which don't exist now," the study group reported. But support is growing for such projects. In addition to President Johnson, former Secretary of Commerce Luther Hodges urged a full-scale feasibility study of such a high-speed line, and Democratic Senator Claiborne Pell of Rhode Island has introduced a bill to create an authority to finance and operate a line between Washington, D.C. and Boston.

Even more revolutionary than jet-propelled "Hovertrains," however, is a long-distance transportation system designed by Dr. Joseph Foa, head of the department of aeronautical engineering and astronautics at Rensselaer Polytechnic Institute. It propels passenger projectiles through tubes at up to 2000 mph.

"Land vehicles are necessarily constrained to travel along narrowly defined paths," he says. "Therefore, unless the prescribed path is a straight line, a land vehicle traveling at high speed must be supported from all sides. This kind of support is best provided within a tube.

Moreover, enclosure makes possible a unique kind of propulsion that would give the vehicles tremendously high speeds and acceleration and deceleration rates. That is, simply to pull the air from in front of

(Please turn to page 250)

How That New Rocket Gun Works

IT LOOKS AND ACTS like a handgun, but the Gyrojet is really a launcher for rockets.

A Gyrojet round is a cartridge-shaped hollow piece of steel that weighs 185 grains at the target. Its peak thrust is 1250 f.p.s., giving it roughly twice the oomph of a GI .45 cal. round or approximately equaling the .375 Magnum cartridge.

Inside the Gyrojet is a stick of standard solid rocket fuel coated with inhibitor and fitted with a pellet of igniter. The rear of the case is closed by a crimped-in steel disc drilled at center for a standard rifle

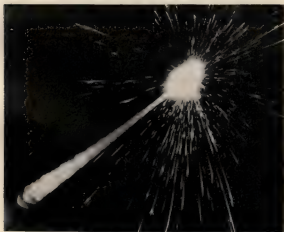
primer cap. Surrounding the primer are four ports, spaced equally and canted clockwise.

When the primer is hit by the firing pin, it is like a miniature rocket launch.

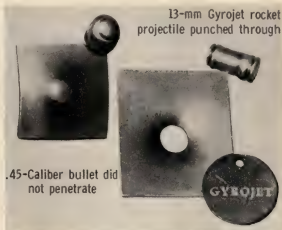
For an unguided rocket, a Gyrojet is quite accurate, although any quality cartridge handgun is more accurate. The makers, MB Associates of San Ramon, Calif., have priced the gun at \$250, and they are offering a guarantee that it will shoot inside five mils C.E.P. (Circular Error Probability), which means a 20-inch circle at 97 feet.—Ken Warner.



DIE-CAST OF ZAMAK AND ALUMINUM, Gyrojet handgun shoots .51 cal. rockets and recoil is almost unnoticeable



SPRAY OF LIGHT in this night shot shows the rocket hitting a steel plate. The light pattern is the propulsion flame from the rocket's canted jet ports



COPPER ALLOY SHEET withstood the impact of a GI .45-cal. solid ball at 100 feet, but the high velocity 13-mm Gyrojet rocket punched right through

Whatever Became of the Village Blacksmith?

By Clarence B. Randall
Retired Chairman, Inland Steel Co.

AT THE TURN OF THE CENTURY, when I was a small boy living in the country in southern New York state, I all but worshipped our village blacksmith.

His shop was right by the bridge over the brook. For me and my gang there was nothing more exciting than to go down there, stand in the doorway, and just watch all that went on. In the center was an anvil, with five or six big hammers hanging on the wall near it, while in the corner stood the forge, where a slumbering fire would suddenly come to life whenever that man of brawn would pump vigorously on the hand bellows. A big white horse might be standing near the anvil, and I can still see Mr. Nowland (we always spoke of him with great respect) lifting one of the animal's hooves, resting it upon his leather apron, and touching it momentarily with a shoe so red hot that it hissed as he tried it on for precision sizing and shaping.

Shoeing horses, however, was only a

part of Mr. Nowland's daily chores. He could do almost anything. If my mother's pump handle broke, he could make a new one. If a pipe came loose in the church organ, he knew how to repair it. In winter, if the runner came off a farmer's sleigh, he could fix it. The more unusual the challenge, the more confident he was that he could meet it.

But quite apart from these unusual skills—or rather, because of them—was his pre-eminence as a leader in the community. He was the superintendent of our Sunday School, the chairman of the church trustees and amazingly, the representative of our county in the state legislature.

How different things are today in the community where I live. There are no "handy" men in the sense that my father used that term. If a repair job has to be done at my house, a half dozen workmen may have to be called in before it is finished. If the plumber, in fixing a pipe in the bathroom, has to cut a hole in the wall,



MR. RANDALL is easily as versatile an individual as the blacksmith he writes about. He is a lawyer, economic expert, author of books and magazine articles, college trustee and student of ornithology. He has served the government in various capacities. In 1956, he presided as the chairman of the Council on Foreign Economic Policy

after him may have to come the plasterer, the painter and the paperhanger; to say nothing of the carpenter if the floor becomes involved. Each of these men is an expert in his field, but each must stick to his craft. This is a penalty which we must accept if we are to have the values inherent in the increased productivity which this reorganization of society has brought to us.

In the manufacturing processes of our great industrial plants it is specialization which raises quality, and lowers for all of us the price of the product. Admittedly, the fragmentation of responsibility in production may at times bring a narrow focus to the effort of a particular worker. But many Americans have a distorted image of the modern assembly line: men and women standing all day long, performing repetitive activities with a deadly monotony, having inevitably a completely empty mind, and being rewarded with no pride of craftsmanship whatever.

This picture I challenge. I do not accept the concept that our situation with respect to specialization is so critical that we must deliberately turn back and try to recapture the era of the village blacksmith. It is the very intensity of our intelligent modern methods, with their resultant enrichment of the effort of the individual, that has made possible the enormous increase in our material welfare.

We must never forget that the more wealth we create collectively, the more there is to share among us. Let us count our blessings. I am very sure that no one of my father's neighbors at the beginning of this century ever in his wildest dreams foresaw the general prosperity which we in the United States are now enjoying—and without specialization that could not have come to pass.

The village blacksmith was an exceptional case. He had one of the rare opportunities in those early days to develop an impressive array of diverse skills, and to sense to the full the deep inner satisfaction that comes from imaginative, self-generated effort. The lives of most of his contemporaries, however, who also lived by the sweat of their brows, were dull and dreary beyond description.

Take the man in the fields, for example. Often as a boy I visited the farm of my uncle during the harvest season. When it

(Please turn to page 212)



Rattle up a deer this year!

Deer "rattling" is almost a forgotten art, but with a pair of antlers and a little practice anyone can bring a buck on the run.

By Pete Czura

IF YOU WANT to add a new dimension to deer hunting this fall, try rattling them up!

The art of calling deer is as ancient as deer hunting but only a handful of sportsmen know about the "rattling" technique, which can be one of the most productive systems to bag your deer.

To become a "rattling" deer hunter is simple. Take a pair of deer antlers, cut them apart, and when you are afield just slam them together to make it sound like a pair of bucks battling. Bucks hearing this commotion will come lickety-split toward the sound of the antlers being banged with the idea of whipping the winner and acquiring another doe.

Battles among bucks are common, especially during the breeding period—the rut—which usually begins with the first chilly nip in the fall. Ruts generally last

6 weeks but have lasted as long as 8 to 10 weeks.

Pick a set of heavy-beamed antlers for your rattling. The sounds of such a pair being banged together will carry the greatest distance. After you have picked a likely spot to hunt, pound the antlers together, twist them back and forth a few times, then slam them together again. Feisty bucks don't back off and keep crashing at each other when battling. After their initial fierce clash, live bucks then rake their antlers back and forth, heads lowered, struggling to obtain a good position in order to render a crippling blow.

Choosing the right kind of rattling antlers can be important. Successful deer "rattlers" have found that mule deer racks are better for this kind of work than white-tailed antlers, because the muley racks are straighter, whereas the white-tails have inward curve, and these make it tough to slam them together properly to imitate a buck battle.

To prepare "rattling" antlers, saw them off at their base on the deer's head and then let them season—dry out. A set over a year old will most likely have a phony ring. And to make your chore of toting your rattlers easy, when heading afield, tie your two "rattlers" together with a cord and sling them over shoulder for easy transportation.

Russ Tinsley, author of "Hunting the Whitetail Deer" says, "Contrary to popular belief, antlers should not be rattled together with the tine points facing each other, as they appear on the deer's head. Rather, the points go in the same direction, with the curve of one antler banged against the curve of the other.

"Avoid using a set of light 'rattling antlers,'" Tinsley recommends. "They will more likely bring in only small bucks. For mean, belligerent, big bucks, use heavy antlers and whack them together slowly, but with great force."

When rattling up your deer it's important to remember that if you want to score you must get your quarry to hear your rattling. The sound of your imaginary buck fight won't carry over 400 yards most of the time. This means you must pick a spot where you know big bucks hang about. A still, clear, cold morning is

(Please turn to page 210)



READY FOR BATTLE, a big buck comes charging into the clearing where he thinks a pair of bucks are fighting. The ideal method for rattling (below) is simply to make certain that the points of the antlers are in the same direction when being banged together to simulate combat

Hot New Ideas in

Boilers the size of attache cases; add-on heating plants for remodeling; reservoirs that retain heat—they sound futuristic, but they're here now!

By John Ingersoll

GEORGE WASHINGTON, if he were alive today, wouldn't believe it!

At the House of Decision, Washington's headquarters at Washington Crossing, Pa., there is the large bed where the General slept, and it is equipped with a bundling board. A sign by the bed explains that the old stone house was so poorly heated that

when Washington received guests they would take to the bed, fully clothed, the board separating them. Piled high with down quilts, they would discuss the business of the day in warmth.

How things have changed. While it's probable that Ben Franklin had told the General about electricity, who would have thought that it would replace the bundling board? And not just electric heat, but an entire wall of radiant heat with push-button control?

That's just a sample of what's hot in the world of heat. The way things are going, the next generation will view the basement oil furnace in the way we now treat the fireplace—a charming, but useless

Direct-fire heating system burner



Home Heaters!

piece of memorabilia. The fuel oil truck may be as useless as the ash can.

Take the new electric heat bank, for instance. In Philadelphia 11 homes are field-testing a heating system called Therm-Bank that stores electrically-generated heat in a combination of chemical salts. With this system you can run the electricity during the low-rate off-peak hours, charging the salts to heat the house the next day.

The bank is an insulated steel-cased box large enough to house a trailer-truck engine. The size is still a problem. The salts are collected in separate steel containers inside.

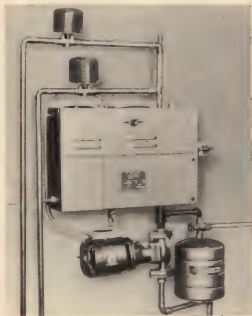
At full charge, the salts are in a molten state at about 900° F. When the thermostat calls for heat, air is passed through the box, heated to its correct temperature, and sent through conventional ducts. Although the bank was designed primarily for heating, it's ideally suited to team with a heat pump for a full heating/cooling cycle. Ten of the 11 test installations are Therm-Bank-heat pump combinations.

The system was developed originally by the Philadelphia Electric Co., and test prototypes were manufactured by General Electric. If the test results over the next several years are positive, these units will be available to the public.

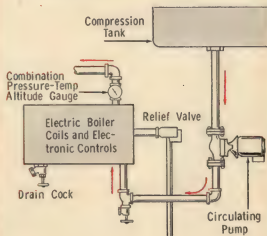
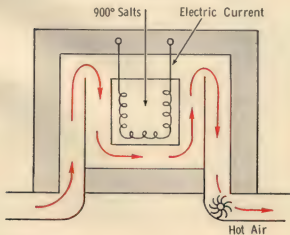
For something new that is already on the market, there are the electric boilers.

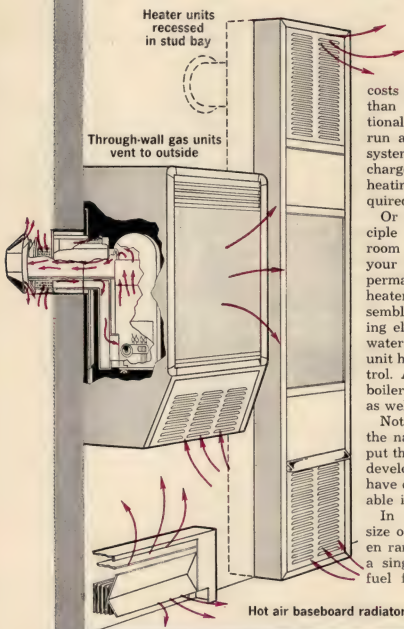
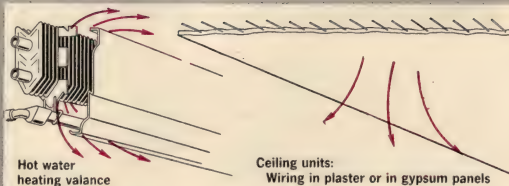
These are nothing more complicated than piped water, heated electrically. But the boiler is big enough to do a whole-house heating job, and the unit packs into a space not much larger than an attache case. The entire works can be fastened inconspicuously to a basement or utility room wall. On the average, installation

Thermo-temp electric boiler and how it works



Gas or oil heat bank—hot air



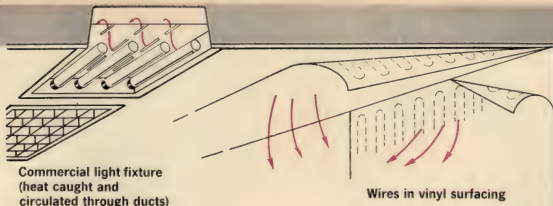


costs are about 10 percent less than the price tag on a conventional system. Operating costs run about equal to a flame-fuel system, and are less than the charges for electric resistance heating. A separate system is required for domestic hot water.

Or you can put the same principle to work heating a single room (one that's been added to your house, for example.) Both permanent and portable room-size heaters are available. They resemble fin-tube, baseboard heating elements in an ordinary hot-water heating system. And each unit has its own thermostatic control. Any version of the electric boiler is great for remodeling as well as new work.

Not to be left out in the cold, the natural gas industry has also put the heat on their research and development people, and they have come up with some remarkable innovations.

In a piece of equipment the size of a normal, stand-up kitchen range (and it looks like one), a single gas connection delivers fuel for four cook-top burners,



plus a condensed "hydronic" heater powerful enough to pour out heat and domestic hot water for an apartment or small southern house. (Output is about 49,000 B.T.U. per hour.) There's even space in the unit left over for pot and pan storage.

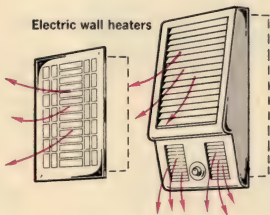
Electric furnaces that heat air over electric resistance coils and then force it through the heating system have been around for some time, but now a cooling coil has been worked into the system for airconditioning. Consistent with the general trend toward smaller equipment, the unit is only 46 inches high, and can push air down from an attic or up from a utility room or basement.

Electric ceiling board, designed for radiant heat, has an electric grid sealed in each panel during the manufacturing process (page 135, Sept. '65 PM).

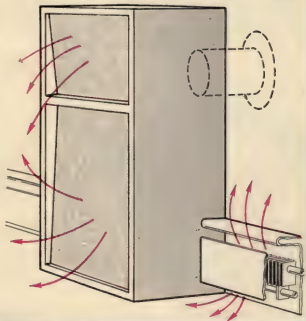
Sealed combustion chamber gas heaters are a new innovation for on-the-spot gas heat. This is now possible because each of the units feature direct "thru-wall" venting. Depending on heater size, the

(More drawings on page 114)

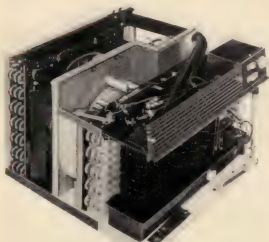
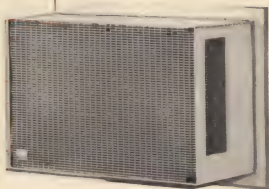
(Text continues on page 232)



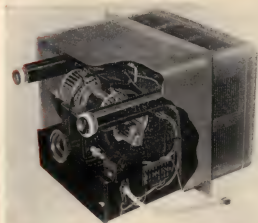
"Furniture" furnace is actually
gas boiler for hot water baseboard radiator



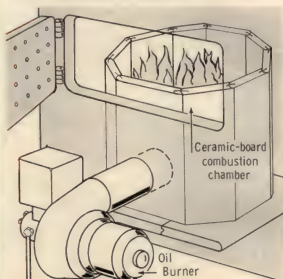
Gas heater— air conditioner units



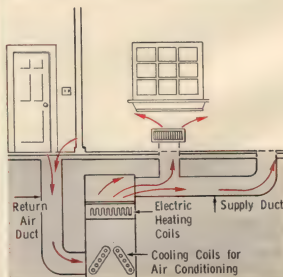
Gas heater—power vent



Firebox liner saves 25% fuel



Electric heater—airconditioner



Escape Suit

Emerging from a simulated 450-foot dive, a test diver in Britain's Royal Navy wears an experimental pressurized suit that allows him to rise quickly to the surface without danger of the bends.

Designed for escape from submarines, the suit is filled with air to maintain a steady pressure on the body. The new suit can be decompressed on the surface.



Global Time

The correct time for any location in the world appears on the face of a new clock from Hamburg, Germany.

Called the Geochron, the unusual clock has a time scale that moves one revolution every 24 hours, indicating the hour in major cities.

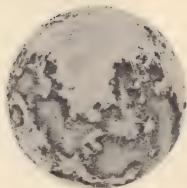
Space Bubble

Plastic balloons could protect astronauts working outside of their spaceships. Similar to the Echo satellites in design, the balloons would be inflated in orbit and would form a cocoon around the work area.

The "bubbles" could be tethered to the servicing spacecraft, and astronauts would enter and leave through an air lock.

The concept was developed by Boeing Company and Air Force scientists.





3 GIANT STEPS TO THE MOON

Part 2

Hardware to launch our moon men involves tractors the size of half a football field; a building so big it breeds rain clouds inside; 40-story rockets—and most of it already is built.

By Clifford B. Hicks

WALK INSIDE our cavernous new moonport and you shrink to ant size. All visitors have the same reaction.

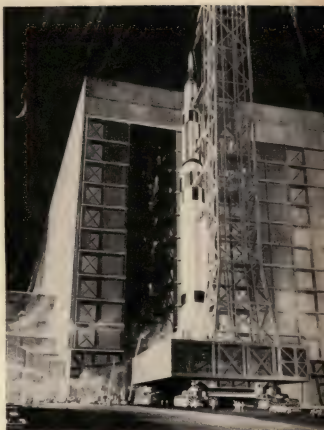
It's the largest building ever built. It could swallow the Pentagon and Chicago's Merchandise Mart, and still have room for smaller buildings. Its monstrous doorway could admit a building as tall as New York's towering Hilton Hotel.

Its size is a reflection of its mission. The building is designed for man's most ambitious undertaking—getting man on the moon by the end of the decade. Surprisingly, this modern wonder of the world, built on Cape Kennedy, Fla., is almost complete. By next February, for all practical purposes, the United States will have the facilities to launch a moon flight.

The moonport is being built at a fantastic pace. Three hundred men, in less than a year, designed the \$1.2 billion facilities; ground was broken just 26 months ago. The architectural problems provided colossal headaches. Before the project is completed, an estimated 300,000 workers will be involved in the construction of the moonport and its space ships.

Four Apollo rockets will be born simultaneously in the building. The first "practice" rocket will be rolled out early in 1967, but the real target year is 1969. Consider what will happen on a memorable day that year:

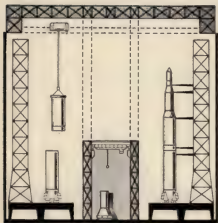
A tractor half the size of a football field will crawl into the vast structure and lift on its shoulders a rocket more than three times the height of the Statue of Liberty, strapped to an even



GIGANTIC MOON VEHICLE will be assembled vertically and moved to launch site in that position. Drawing (left) shows a derrick positioning the first stage

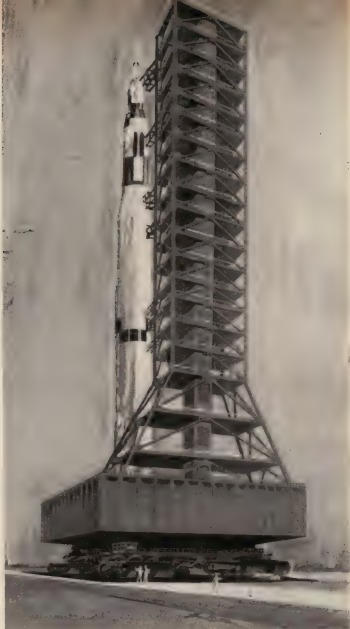


WORLD'S BIGGEST BUILDING, the Vertical Assembly Building (VAB), nears completion. It's 525 feet tall, 710 feet long; 515 feet wide, has doors 460 feet high



CAVERNOUS "VAB," shown in cross-sectional drawing, contains four high bays, each equipped to hold a Saturn V-Apollo vehicle and its mobile launching tower. Second bay area is seen through doorway.

SNAIL-PACED TRIP of rocket and tower (right) to launch site is made aboard the crawler-transporter. Half the size of a football field, this fantastic machine can carry loads up to 12 million pounds



DESTINATION MOON. Blast-off will be an awesome sight as the Saturn V unleashes a thrust of 7.5 million pounds to lift off the pad a total weight equal to that of 2000 medium-sized automobiles



taller launching tower. It will ease this towering load through the tallest garage doors ever built; and it will crawl away at a snail's pace to a 5° ramp placed a little more than three miles away. As the tractor climbs the ramp, computers inside will sense the faintest sway of the 446-foot, 11.5-million-pound load and keep it as precisely balanced as a circus acrobat on a pole. Then the tractor will carefully deposit it over a great flame bucket.

The rocket then will accept its 5.5 million pounds of fuel and its 500 pounds of human cargo. At the fateful moment a button will be pushed 3½ miles away, and man will soar off to explore and colonize his solar system.

The monstrous structure that will give birth to the moonshot is called the Vehicle Assembly Building, or simply VAB. You can see VAB any Sunday between 1:00 and 4:00 p.m. You can also drive past three of the mobile launching towers, examine the two incredible tractors (one backs up the other) and drive past two completed launch pads.

And you'll see signs of the moonshot throughout the Cape area. The nearby town of Titusville proudly boasts that it is "The Gateway to the Moon," and the village of Oak Hill stakes out even more of the cosmos as "The Gateway to the Universe." You can snack on moonburgers, and you can watch the kids orbit the playground at the Satellite Christian Kindergarten and Day School.

VAB is 525 feet high, the equivalent of

52 stories (it is the tallest structure south of the Washington Monument), and it encloses a third more space than the Great Pyramid of Cheops.

It has to be big. "From this spaceport," says a NASA official, "we'll be able to orbit a 36-man space station with enough supplies for a year; to send a 45-ton spacecraft to the moon; and to launch a 30-ton ship to Mars or Venus."

The airconditioning system could cool all the homes in a city of 15,000. It presented the designers with perhaps the strangest architectural problem ever: The building is so vast it could actually breed its own rain clouds beneath the roof. Only parts of the structure are air-conditioned, and cool dry air from these areas, mixed with the humid, hot Cape air, could produce thunderheads. Showers would drench the scientists and their precious rockets, thus defeating the very purpose of the building. Supplementary ventilation, it is hoped, will solve this.

Just holding up such a building in the shifting Florida sands presents problems. The building rests on 4225 steel stilts, each 16 inches thick and 160 feet long, that reach down to bedrock.

Holding the building *down* is a problem, too. To keep it from taking off like a box kite, it is anchored solidly to its forest of buried stilts and is designed to withstand 125-mph hurricane winds.

The purpose of VAB is to provide a controlled environment in which huge but delicate rockets can be assembled. All



LAUNCH PAD, shown under construction, has ramp (far side) with a gentle 5° rise. This is a critical stretch for the delicately balanced moon rocket

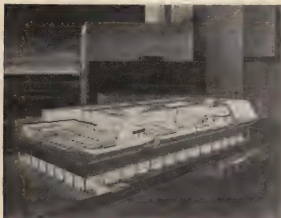
NOV. 1965



GARGANTUAN TRANSPORTER has four pairs of crawlers like those shown. Each crawler has 47 separate shoes and each shoe weighs more than a ton



MERRITT ISLAND MOONPORT was laid out on land reclaimed from swamps. Rattlesnakes still abound



MEN LOCATED CLOSEST to astronauts during launch are in the Launch Control Center, a beehive of computers, giant TV screens and other electronic gear



DARK LOUVERS are electrically controlled and can be positioned to cut down glare of the sun and provide operators with a clear view of the launch area

manned rockets of the past were built atop their launching pads, but early in the moonshot planning it became obvious that Saturn V would be so complex that it would have to be assembled indoors. The only way to do this is to move the launching pad itself inside a permanent building, assemble the rocket on it, and then move the pad out again.

VAB is divided into four identical high-bay sections and one low-bay section. The various stages of Saturn V will arrive on barges at a nearby pier. From there, they will be hauled horizontally on a trailer to the low-bay area, where they will get a preliminary checkout.

Meanwhile, one of the two huge tractors will ramble over to a nearby parking lot, fetch the particular rocket's own launching pad (called a mobile launching tower) and deposit it in a high bay.

The launching tower is considerably bigger than the rocket itself, and in some ways more spectacular. Measuring 446 feet high, it looks like some futuristic oil rig. Its two-story base is built and compartmented like a battleship, and holds banks of computers whose long, wiry fingers will probe each of the thousands of

vital organs of the Saturn rocket as they are installed, providing a running physical examination. One NASA expert estimates the base of the tower holds enough electrical wire to reach to the moon.

Running through the steel framework of the tower is a high-speed elevator, the type found in skyscrapers. It provides access to each level, and a means of escape should fuel spill during countdown.

After this self-contained tower is deposited inside VAB, a crane in the peak of the building will swing the Saturn V booster onto the launching platform. Then the other two stages will be stacked like blocks atop the booster, with the moonship balanced on top. The crane that provides all this muscle is so sensitive that it can raise a 250-ton load as little as $\frac{1}{32}$ -inch.

To enable the technical experts to swarm over the rocket at any level, all bays have five mobile work-platforms, each two or three stories high, that end in semicircular cutouts. The 100-ton platforms move in and out like suspended file drawers, mating to form buildings inside the building.

(Please turn to page 228)

Tank Cat

Discarded jet fuel tanks bound together with torsion arms and powered by a sail on a tripod mast became the major hardware of a homemade catamaran.

A sheet of canvas—perforated so it won't act as an airfoil—makes the deck. The torsion arms allow the hulls independent movement with enough rigidity for control, and the tripod mast distributes the load of the sail evenly. Thin aluminum fins are installed on the keel side of the tanks for stability.

The maker, Louis Vernon of Pennsylvania, has dismantled the 19-foot catamaran and transported it on the roof of a Volkswagen. He has designed smaller 15 and 13-foot catamarans as well.



Free-Power Radio

Place this set in sunlight and you never spend a cent operating it. Solar cells in the handle keep the Zenith Sun Charger working and charge the built-in nickel-cadmium batteries for nighttime listening.

Sharp Curves

A knife sharpener using grinders mounted in a cross position will sharpen even the serrated edges of carving and bread knives.

A spring keeps the rotating grinders of the Ikos knife sharpener pressed to the blade regardless of its curves, says the Belgian manufacturer.



SUB-MINI's

Those Mighty Midget Cameras

Try a tiny camera that fits in a shirt pocket. With some know-how you'll make good pictures

By Bob Berger

TWENTY-FIVE YEARS AGO, you probably didn't own a subminiature camera (one using film smaller than 35-mm) unless you also carried a code number, a Luger automatic and had a secret radio transmitter hidden in your attic. Tiny, precision cameras were strictly cloak and dagger items. Not so today. In fact, subminiature snapshots are clicking away at a record rate.

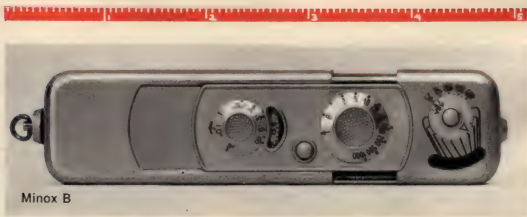
From a bumper crop of tiny cameras, *PM* selected some of the more popular models—those you are likely to find stocked at the local camera shop—and put them through their paces.

Seven sub-minis were tested:

The Minox B, the granddaddy of all tiny cameras, is made in Germany, and is



Minolta 16 II



Minox B



Minolta 16 CDS

Rollei 16



EXCLUSIVE PM PHOTOS



Tessina



Edixa 16



Yashica 16 EE

not much larger than a man's index finger. Shutter speeds range from $\frac{1}{2}$ -1/1000 sec. Lens aperture is fixed at F:3.5. Film is available in either 36 or 50-exposure cartridges. Special features include built-in filters, measuring chain for close-ups, built-in coupled exposure meter, and bright line viewfinder with automatic parallax correction. The price is \$149.95.

The Minolta 16 II, 16 Ps and 16 CdS are Japanese-made submini's that give 20 exposures on 16-mm film. The 16 II has a fixed focus F:2.8 lens and shutter speeds to 1/500 sec. The 16 Ps is equipped with a fixed focus F:3.5 lens and a "Weather Dial" exposure control. A two-way shutter speed selector sets the shutter at 1/100 sec. for daylight snapshooting or at 1/30 for flash pictures. The 16 CdS has, as its name indicates, a cadmium sulphide electric eye that automatically adjusts the diaphragm setting for the four-element F:2.8 lens. A green signal shows in the bright frame viewfinder when there is sufficient light for picture making. The 16 II costs \$37.50, 16 Ps is \$25.50, and the 16 CdS is \$79.50.

Bearing a name familiar to most camera buffs, the Rollei 16 uses an 18-shot cartridge. The lens is a Tessar F:2.8; exposure is set automatically, but manual control is possible. A go-ahead green dot is incorporated in a luminous frame viewfinder corrected for parallax. The camera sells for \$179.50.

The Edixa 16 has a Xenar F:2.8 lens, and an automatically programmed shutter and diaphragm using the light value system. Speeds range from 1/30-1/500 sec. Cartridges are loaded with 21 exposures. It is priced at \$99.50 with meter, or \$79.50 without.

The Yashica 16 EE makes 20 exposures on 16-mm film. The camera has an F:2.8 fixed-focus lens, and features thumb-wheel film advance and electric eye exposure setting. The price is \$55.

Rounding out the group is the Tessina. By our own definition, it is not a submini because it uses 35-mm film. But its light weight—5½ ounces, and small size—2 x 2½ x 1 inches, seem reason enough to include it. The Tessina boasts a number of unusual features: spring motor film advance, reflex viewing, and a negative two or three times larger than most of its competitors. Shutter speeds are from $\frac{1}{2}$ -1/500 sec. The lens is a 25-mm F:2.8 Tes-

(Please turn to page 243)



SWISS-MADE TESSINA is shown here with an accessory pentaprism viewfinder. The finder sells for about \$40 and gives a 6x magnification for easier focusing. An 8x magnifier is also available for \$19.95

PROCESSING TIPS

First of all, your darkroom must be clean; dust is the archrival of the subminiature photographer. A tiny, unseen speck that settles on a negative will show up in the enlargement as an aspirin-sized white blob. But dust is pesky stuff; even after a thorough cleanup, you may find that you are still getting spotty prints. In such a case, it's likely that static electricity is the real culprit. Try grounding your enlarger to a water pipe, and use an antistatic brush (available at most photo shops) to clean the negative.

Development of submini film isn't difficult, though care is needed in controlling solution temperatures. Your best bet is to follow the manufacturer's directions. Generally, if developer, stop bath, hypo and wash water are kept at 68-70° F., you'll get good results.



WEATHER DIAL on Minolta 16P uses symbols for common lighting conditions. Exposure is set by turning pointer to the proper symbol



ROLLEI 16 has excellent luminous frame viewfinder, handy milled wheel for setting distance scale which is visible through window



RIGHT ANGLE VIEWFINDER on Yashica 16 EE is especially handy for candid shots of kids and even adults who tend to mug for your camera



TOP SHOT was taken with Minolta, middle picture with Tessina. A Rollei 16 made bottom shot. All enlarged well to 8 x 10

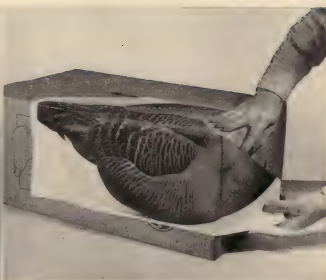
The importance of precise temperature control makes an accurate thermometer an absolute must. So-called process thermometers are not expensive and are consistently correct within one degree.

All solutions should be filtered, either through laboratory-type filter paper or a tuft of cotton placed in a funnel. Even the wash water can deposit sediment which may become imbedded in the film emulsion. One way to beat the problem is to bathe the film in hypo eliminator after it is thoroughly fixed, then simply soak it in several changes of filtered water.

Excessive grain can ruin film shot with even the best submini. Expanded grain is often the result of long development and washing times. With this in mind, try to choose a fine-grain

developer having a reasonably short working time and use hypo eliminator to cut down wash time. After washing, don't sponge or squeeze the film, instead, dunk it in a wetting agent and hang it up to dry.

Once you get really hooked, you'll probably want to buy darkroom equipment specifically made for submini work. Various developing tanks are available, as are special enlargers. These are usually of the condenser type and are fitted with short focus lenses for big blow-ups. If you prefer, you might buy a 25-mm lens for your present enlarger and use that for submini negatives. Other than the tank, enlarger and plenty of perseverance, there's nothing else you'll need to develop and print submini films. Happy processing.



Small-Batch Readymix You Haul Yourself

Small concrete orders are such a nuisance that most readymix suppliers tell you to hoe up your own. But not the Trailer Mix Concrete outlets, now spreading across the Western states. They're in business strictly for small-batch pour-it-yourselfers. Their setup has a hopper car

that rolls under three big bins to catch regulated amounts of gravel, sand and cement. The car then dumps into a mixer which, in turn, dumps into a special trailer hitched to the customer's car (left). At the pour site a hydraulic system jacks up the trailer to discharge the load (right).



Paper Decoys

Lifelike goose decoys are easily made from paper cutouts pasted onto cardboard boxes.

Available in Canadian Honkers, Blues and Snow Geese, the bodies and heads are printed on gummed paper. These sheets are laid over a cardboard box, cut out and assembled. They can be waterproofed by coating with a dull varnish.

Each set includes eight sentinels and four feeders, and they are priced at \$4.95 from Decoys, Box 66, Rosemount, Minn.



X-ray of 2000-Year-Old Mummy

X-ray above shows the skull of a mummy at the Smithsonian. Films of the encased body (right) were made at a Navy lab with a powerful machine ordinarily used for examining rockets. The X-rays revealed the remains of a man of 25 who lived during Cleopatra's time.



Bottoms Up Down Under

THINGS GOT A BIT OUT OF HAND when the Australian Catamaran Assn. set out to obtain a water ski picture to publicize the speed and power of the Big Class C cats. Since the camera was loaded, the photographer just kept shooting and came out with this spectacular tip-over series—which first appeared in the United States in *One-Design Yachtsman*.



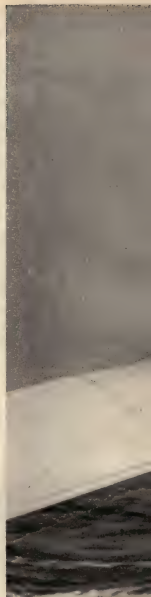
1... **POWERFUL CAT** with 300-square-foot sail was able to pick up skier from a deep start and pull him to a speed of over 20 mph



2... **FUN STARTED** when the lee hull went under. As helmsman attempts to free sheet, trapeze man seems to shrug his shoulders



3... **UP, UP AND AWAY**, with trapeze man now taking a dip off bow as the helmsman glances frantically around for a ladder





4...GERONIMO! Mast hits the water, tossing the hapless helmsman down into the middle of 300 square feet of expensive sail



5...JOLLY GOOD CHAT aboard upsidedown cat was undoubtedly not type we could print. The boat, incidentally, wasn't damaged

Brain Control by Radio

*Will entire populations be controlled some day?
Already, electrical impulses to the
brain can halt a charging bull, quiet a raging
monkey or make a sedate woman act flirtatious*

By John A. Osmundsen

SPECTACULAR SUCCESS in recent experimental attempts to control the social behavior of animals—and of people—by electrically stimulating their brains has led some persons to ask, very soberly, questions that seem to come right out of the annals of science fiction.

These questions have to do with the feasibility of achieving robotlike control over a population of human beings by electrical stimulation of the brain, say, with radio waves that would surround them and secretly direct their thoughts, desires and actions.

Such remotely imposed influences on the brain might be as innocuous as simply producing feelings of happiness and pleasure in a population or as insidious as motivating mass behavior for political purposes. But moral and legal questions aside, the technical ability—at least on an individual basis—exists. The key is ESB—electrical stimulation of the brain. An expert in the field says that “functions traditionally related to the psyche, such as friendliness, pleasure or verbal expression can be induced, modified and inhibited” through ESB.

In animal experiments, for example, weak currents sent through wires implanted in selected regions of the brains of cats and monkeys have permitted scientists to “play” them “like little electronic toys.” The animals opened and closed their mouths, stood up, turned around, climbed, fought, hid, yawned, licked, slept and mated—all on electronic command.

What was probably the most spectacularly convincing experiment of this sort involved a Spanish fighting bull in whose brain some 20 electrodes had been implanted. On the day after the operation, a scientist playing the role of bullfighter, armed with only a cape and a radio transmitter, stopped the bull in full charge by sending





BRAVE BULL VS. BRAVER SCIENTIST. A tense Dr. Jose M. R. Delgado stops the angry animal in its tracks with a quick signal from hand-held transmitter



STRANGE THINGS HAPPEN to monkey's eyes when current is applied to electrodes in brain. Compare size of constricted right eye (photo at right) with normal eyes (left). Effect comes from stimulation of specific brain region

a radio signal to the creature's caudate nucleus—a region of its brain that inhibits aggressive behavior. Stopped within 15 feet of the man, the bull suddenly turned to the right and trotted off in response to a second radio stimulation, this time to a motor neuron that directed such movements.

The behavior of humans, too, has been modified in a variety of ways through ESB. They have been made to feel pleasure, anxiety, friendliness and sexual attraction. They have experienced total recall of past experiences and a sort of hallucinatory "double consciousness" of real and unreal perceptions simultaneously.

The state of being doubly conscious during ESB has been described as feeling as if a tape recorder or movie film, sound track and all, were running in one's brain and playing back a previous experience—such as attending a ball game or concert—while at the same time the individual is perfectly conscious of everything that's going on in the present.

Some persons under ESB have temporarily lost the ability to think or to express themselves. And some have suddenly upped their verbal output as much as fivefold without any loss of continuity or intelligibility.

An 11-year-old boy who underwent implantation of electrodes in his brain for diagnosis and treatment of epilepsy in-

creased his verbal output from 17 words every two minutes to 88 words. In addition, he seemed to be especially optimistic and friendly toward his doctor during stimulation.

ESB produced a different effect in an attractive 32-year-old epileptic woman. Usually reserved during interviews with her doctor, she became visibly altered during stimulation of her brain. She held her doctor's hands, expressed fondness for him and began to act flirtatiously.

Judging by the results of such experiments, it seems less science fiction than fact that it might be possible one day to control the general behavior of an entire population. Asked about this, one of the foremost authorities in this field said: "Fortunately, that prospect is remote, if not impossible, not only for obvious ethical reasons, but also because of its impracticability."

Those are the words of Dr. Jose M. R. Delgado of Yale University's School of Medicine, where he has been studying the effects of ESB on animals and humans for the past 15 years.

The physical variability of brain structure among different persons, Dr. Delgado explains, would make it almost impossible to place an electrode in precisely the same spot in a large number of brains.

There is also great functional variability

(Please turn to page 222)



OPPOSITE EFFECT results from stimulation of another site. By varying current, scientists can control animal's pupil like the diaphragm of a camera



ANGER BECOMES APATHY under stimulation (right). Wire leading to electrode can be seen in lower photo. Electrodes are implanted under anesthesia and are said to cause no pain or damage of brain tissue



MEEK FEMALE

has learned that she can change bully (sitting in corner of cage) into nice guy by pulling lever that controls radio signal. She looks at him while operating lever, which is unusual, say researchers. A lower-ranking monkey ordinarily doesn't look straight at the boss for fear of retaliation. When not being stimulated (below), the bully reverts to type and, with nothing better to do, tries biting his own hand.





They're Burning

Slicing through solid granite with 3500-degree flames, workmen are creating a gigantic Southern Memorial on Georgia's Stone Mountain

By Bill and Juana Wilson

WE FELT THE ELEVATOR LURCH upward. Below us we could see the ground dropping swiftly away as we were carried up alongside the precipitous granite mass of Stone Mountain. Our view from the moving cage was spectacular. Almost before we could catch our breath we were stepping outside again onto a narrow metal walkway high in the sky.

A few feet above our heads the Stars and Bars, battle flag of the Confederacy, fluttered at half-mast in a gentle breeze.

IT'S A LONG WAY up the side of the big rock. Though scaffolding and elevator are anchored in granite, the sky-high carving isn't recommended for faint-hearted types

a Memorial into a Mountain

As we eased gingerly away from the elevator, burdened with cameras, flash equipment and a tape recorder, my wife inquired about the flag.

"It's at half-staff in memory of a friend of ours," Pete explained, "A photographer. He was killed here at Stone Mountain a couple of weeks ago."

Thus, 35 stories above the ground and with considerable misgivings about our assignment, we Illinois Yankees began unlimbering our equipment to do the story of a Confederate mountain carving 16 miles east of Atlanta, Ga. Wearing hard hats and equipped with earmuffs to drown out the roar of the big jet torches, we watched a four-man crew literally burning a Southern lady's dream into the granite face of Stone Mountain.

Fifty years have passed since Mrs. Helen

Paine, president of the Atlanta chapter of the United Daughters of the Confederacy, first approached sculptor Gutzon Borglum with an idea of having a small bust of General Robert E. Lee carved out of the mountain. Borglum, who never thought "small," conceived a colossal procession of Confederate soldiers and officers, both afoot and on horseback, marching around Stone Mountain's granite base. It would require 10 years and \$3 million to finish the job, he estimated.

Arriving at the memorial site in 1918, Borglum began working on his models and conducting experiments to determine the effects of dynamite and drills on the stone. By night he used a giant slide projector to enlarge a pen and ink sketch of his creation against the side of the sloping mass of granite. Men suspended on ropes



BIG CUTTING TORCH roars as it burns into rock, making earmuffs necessary. It's like a small jet engine, burning mix of kerosene and liquid oxygen



HEADS AND FORMS of heroes and outline of horse begin to emerge from the north side of the mountain. Some of the carving dates back to the late 1920s



DOME-SHAPED STONE MOUNTAIN is said to be the world's largest single chunk of granite, weighing an estimated half billion tons. It's about 5 miles in circumference, covers 583 acres and rises almost 700 feet above surrounding terrain



ORIGINAL MODEL OF MEMORIAL by sculptor Augustus Lukeman includes (starting at left): Jefferson Davis, Robert E. Lee, "Stonewall" Jackson and a color bearer. On full-scale carving, the distance from Lee's head to his horse's hooves is 138 feet

used white paint to copy Borglum's projected drawing onto the mountainside. By 1924 the sculptor had finished carving the first head of General Lee. To celebrate the occasion he served an "unveiling" dinner to 20 notables seated at a banquet table on the general's shoulder 350 feet above the surrounding terrain.

But Borglum was a temperamental genius, and a rift developed between him and the Stone Mountain Confederate Memorial Assn., which had employed him. In March, 1925, he was fired from the project and hurriedly left the state before a warrant could be served charging him with the destruction of his models and sketches.

Sculptor Augustus Lukeman was next

engaged by the association to complete the memorial. Upon arriving at Stone Mountain, Lukeman discovered that his predecessor had committed a blunder in transferring his design onto the mountainside. This resulted in a tremendous distortion of the figures when viewed from different angles. Nothing more could be accomplished until the completed head and shoulders of General Lee were destroyed. Lukeman proceeded to dynamite away Borglum's work and substituted his own design of Jefferson Davis, Robert E. Lee and Stonewall Jackson, all mounted on horseback.

Early in 1928 a new head of Robert E. Lee, this time Lukeman's, was unveiled, and the rest of Lee's figure and that of his



TRIM BEARD of General Lee is measured before a smoothing operation. Standard engineering methods are followed in plotting dimensions on the rock wall



SMALL PNEUMATIC TOOLS are used to smooth the surfaces of General Jackson's mouth and left ear. The heroic heads are more than 15 feet in height



TEAMWORK IS VITAL to safety—man straddling plank is steadied by two linked buddies. Numbers on rock face show depth pilot holes are to be drilled

horse were blocked out. When completed, the carving would measure 138 feet from the top of Lee's head to his horse's hooves. The general's sword would be 58 feet in length, and, if detached, would weigh approximately 100 tons. The ears of Traveler, General Lee's famous horse, would stand 12 feet high.

By midsummer 1929 funds for carving the memorial were exhausted, and work on the mountain was discontinued. And so it remained for 35 years, its cables and stairways falling into ruin. Lukeman returned to his home in New York where he died in 1935, never losing hope that someday he would return to Stone Mountain and complete his unfinished masterpiece.

In 1958, Georgia's legislature appointed a new Stone Mountain Memorial Assn., to be accountable to the state, and authorized the purchase of 1950 acres, including all of Stone Mountain, for just under \$2 million. A bond issue was arranged, and nine prominent sculptors were invited to submit designs. In 1963, Walter Kirtland Hancock of Gloucester, Mass., whose plan incorporated the completion of Lukeman's unfinished work, was chosen for the job.

By the following year workmen were busy once again at the memorial site. First they erected the world's tallest outside elevator, 350 feet in height, anchored firmly to the granite mountainside. New scaffolding, suspended on cables from the

(Please turn to page 218)

Life That's Made to Order

By irradiating living tissue, scientists at a unique agricultural laboratory are producing forms of life suited to man's special purposes.

*By Arthur Whitman
Photos—Kurt Gunther*

IT LOOKS LIKE A PLEASANT FARM on rolling pastureland, spattered with up-to-date buildings that gleam in the sunlight. But, in the sterile corridors, you'll find a handful of white-coated men, who, obviously, are not farmers. They are quiet, friendly scientists who—only a generation ago—might have been depicted as horror-movie madmen. For they are placidly engaged in twisting and changing the course of nature—forcing the hereditary factors in living things to do what they wish them to do in order to make them more useful to mankind.

"Nature's a lovely lady," explains a spokesman at the Atomic Energy Commission's Research Laboratory, operated by the University of Tennessee. "But I guess that like all gals, she's slow about some things and strong-willed about others. We're trying to help her see things our way."

In past years, the "Ag Lab," under the direction of Dr. Nathan S. Hall, has tickled nature into producing such amenities as some of the world's best cattle and poultry feeds. To untrained eyes, these look very much like any other alfalfa or hybrid corn you might see. Stems are a little greener, grains a trifle plumper, that's



IRRADIATION PAD at AEC's University of Tennessee laboratory is used to expose animals. Sources are imbedded in concrete; "hairpin" stalls can shield some parts, expose others. Burros are used because weight distribution is similar to humans'



ROOTED CUTTINGS of plants are set up for bombardment by fast neutrons. Reactor is in pool below table. Progress is monitored by TV when source is exposed

NOV. 1965



NEW VARIETIES of ornamental plants are produced by irradiation. Fast neutrons can create unique colors, shapes or sizes never before seen in nature



BURRO SUBJECTS show some effects of radiation. Two-toned fellow sports white skin from which hair has fallen due to dosage. Scientists explore metabolism



COLOR AND FORM of irradiated chrysanthemum cuttings were permanently changed by mutation, creating new varieties, as shown here. The "Sport" at left bred a brand new variety of flower, right



DR. THOMAS OSBORNE gathers the seed from cotton left to winter. Seeds of disease-resistant American, and Egyptian long staple varieties, are irradiated in attempt to produce desirable cross



LEAF MARKINGS and shapes can be changed by irradiation, in plants that normally refuse to produce "sports" in Nature. Here's an example of some leaf characteristics changed by fast neutrons



WASPS appear to adapt themselves to radioactivity. Some select radioactive mud for nests. The lab's Dr. Alvin Shinn is studying them to see how they do it

all—except that the plants contain as much as 35 per cent more nutrients than their direct ancestors did, a factor of incalculable commercial value to stockmen and farmers.

The changes were produced by irradiating seeds and plant cuttings with gamma rays. This affects the genetic structure and tends to produce mutations at a much faster rate than would occur naturally. "You can see how slow mutant production is in Nature by thinking, say, of the number of human midgets alive at any one time," says Dr. Hall. "In a world population approaching four billion, there may be a thousand or so midgets living at any time. We're able to produce scores of similarly drastic mutants almost at will. All we have to do is expose a large enough plant population to radiation."

Books have been written about the manner in which radiation affects living things. Ever since Hiroshima, the public has had a pretty good idea about the damage that gamma rays can inflict on cells, changing their reproductive characteristics drastically; sometimes producing rampant growth resulting in cancer. Frequently, however, more subtle changes occur in genes subjected to radiation. These microscopic controllers of growth determine every factor in your size, shape and color. It has been determined that one single gene determines whether a person will be white or negro. Genes are the targets of the scientists now busy with this work.

Mum Colors Never Seen Before

Today, among a host of other plant projects, the lab is busy developing new ornamental flowers and shrubs. A typical experiment is being carried on by horticulturist Dr. John E. Love, who is taking rooted cuttings of established chrysanthemum varieties that never produce "sports" naturally, and bombarding them with fast neutrons by irradiation. An incredible variety of resulting mutants shows all sorts of new characteristics—everything from gorgeous, eye-popping new colors to stems so weak they can't support their own foliage, let alone blossoms. Those with desirable characteristics are propagated again, crossed with each other as necessary, and so on, until a planned goal is reached. Results of a year's work to date: four new mums in colors never seen before.

A longer-range plant experiment is an attempt by agronomist Dr. Thomas S. Os-

(Please turn to page 210)



ANIMAL EXPERIMENTS include study of way glucose is metabolized in brain of Burros. Brain blood is drawn from an irradiated subject, above

CALF TIED to tip table is prepared for operation to implant a plastic tube to an internal organ. Isotopes are placed in organ; reactions are then studied

borne to establish a new variety of cotton. For over 150 years, there have been two dominant cotton varieties. One is the American Upland, the standard U.S. plant, which gives high yields and is disease resistant. The other is Sea Island, the Egyptian variety. It is a comparatively low-yield, disease-prone plant, but it has a fine, long-fibered boll that produces high-quality threads.

Countless attempts have been made to cross the two breeds, but the best that was ever achieved was a single-generation cross—one that separated out in the second generation. By irradiating the seeds and selectively pollinating resulting plants, Osborne has achieved at least one cross that has been stable for several generations, although it has too many undesirable characteristics to be of any value. In a few more years, he may well come up with the long-cherished Sea-Island Upland species.

Although the Lab in the past has tried to improve animal breeds, it has given up such work because the generation process takes too long for fruitful experimenta-

tion. Its work today is centered largely on determining the effects of radiation on animal ecology and on pinpointing the effects of radiation on metabolism.

To carry on these experiments, the Lab has a large, well-equipped veterinary facility, complete with modern stables, a fully equipped animal surgery staffed with some of the most highly qualified vets alive, and a deceptively sinister little radiation pad, where Gamma-ray sources are imbedded in concrete, and special holding stalls are designed so that animals can be irradiated over their entire bodies—or else shielded so that only a particular body area or organ is exposed.

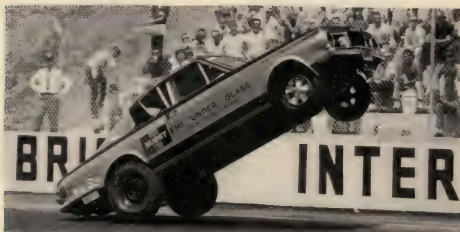
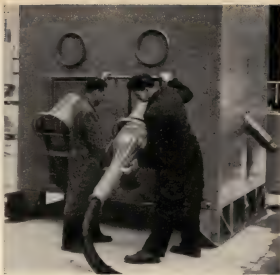
One of the most promising current experiments is being carried on now by Dr. Matthew Wykoff, who has discovered that low-level radiation affects the manner in which the brains of burros metabolize glucose, one of the basic nutrients. "I may be onto something fundamental in the chemistry of mental disorders," says Wykoff. "It's hard to tell just now."

Fathoming Nature's secrets, it seems, is as difficult as improving on Her. ★★★

Big Socket

Perhaps the largest "wall socket" in the world, this one from Germany needs two men to plug into it.

Plugging in taps a 35,000-volt supply designed to provide a special source of electrical power to industrial plants. The Siemens power unit is described as "portable"—though it'd appear you need a large truck or railroad train.



Flying "Fish" Skims Overland

All four wheels airborne, this Barracuda starts down a drag strip on its bumper casters. The "Hemi Under Glass," driven by Bill Shrewsbury of Los Angeles, does most of the quarter mile on its hind wheels. Engine is a rear-mounted hemi 426.

Black TV

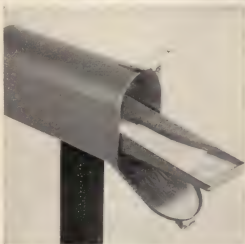
Black glass mounted across the front of a new Westinghouse 19-inch portable TV eliminates that staring-eye look when the set's turned off.

When it's operating, the glass filters light from the screen to give a picture that is softer, clearer and easier to watch. An instant-on circuit produces a picture as soon as the set is switched on.





CARRYALL of plastic holds several separators which can be arranged to fit large or small shop, household or garden items. Unit is 15 inches long, comes in colors, costs 99 cents from Snyder Co., Westmoreland and Stokley, Philadelphia, Pa.



MAIL TRAY slides into and out of standard size R.F.D. mailbox, slides forward, tilts downward to bring mail within easy reach of a car window or children. In plastic, it's \$1.49. Available from Epco, Inc., 2614 Nicollet Street, Minneapolis, Minn.



MANTLE LAMP for natural or L/P gas mounts on flat walls or in corners, conserving space. Unit is well suited for standby or emergency lighting in electric or mobile homes. Price: \$15.50. By Humphrey Prod. Div. of General Gas Light Co., Box 2008, Kalamazoo, Mich.



HAND VACUUM CLEANER is designed for easy touch-up cleaning in home, car, boat or workshop. Unit weighs only 5.2 pounds, has 20-foot cord for wide-area coverage. Frame of unit is cast aluminum. The .14 hp motor gives one-third the suction power of standard vacuums. Price: \$24.95. Available at all Singer Centers.

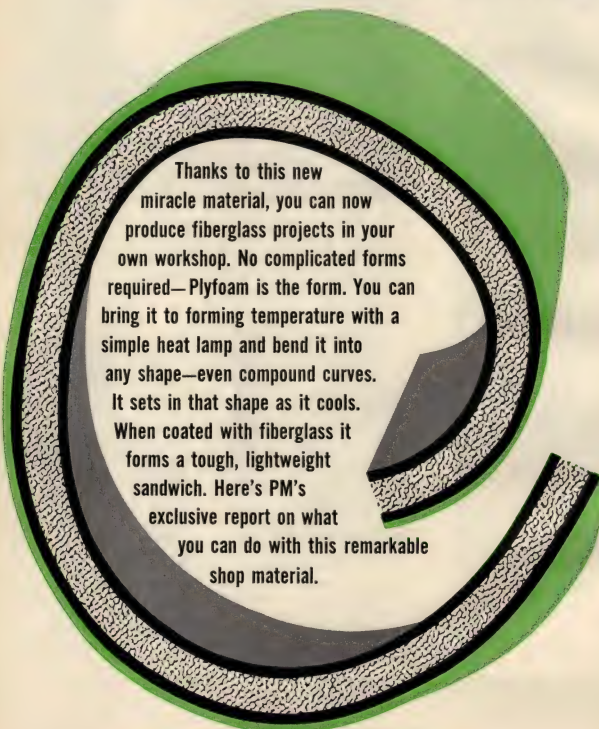


LOUVER SCREEN installs in ordinary window frames, provides privacy. Screen cleans with hose, costs \$2 per sq. ft. Louver Screen Co., 1214B W. Burbank, Burbank, Calif.



LIGHT SWITCH HANDLE allows children to turn lights on or off without adult help. Ten-inch pull screws onto switch plate. \$1 from Look Products, Box 271, Deerfield, Ill.

PLYFOAM:



Thanks to this new miracle material, you can now produce fiberglass projects in your own workshop. No complicated forms required—Plyfoam is the form. You can bring it to forming temperature with a simple heat lamp and bend it into any shape—even compound curves. It sets in that shape as it cools. When coated with fiberglass it forms a tough, lightweight sandwich. Here's PM's exclusive report on what you can do with this remarkable shop material.

Incredible new workshop wonder

By Arthur Mikesell

A THOUSAND SHAPES to suit any project, plus featherlight construction with incredible strength—it's all possible with Plyfoam, a revolutionary new material that makes fiberglass construction practical in your home workshop.

A true thermoplast, Plyfoam is a rigid foam sheet that becomes pliable as felt when heated to about 200°. You can form it into compound curves, bend it with almost complete freedom of shape. Once it cools, however, it becomes rigid in the new shape and can be covered with fiberglass to produce an ultralight, strong sandwich construction.

Available in 46 x 56-in. sheets of ¼-in. and ½ in. thicknesses, Plyfoam is a special type of unicellular polyvinyl chloride plastic from Plyfoam, Inc., E. Bethpage Rd., Plainview, N. Y. You can cut it with a razor blade or pocketknife, sand and shape it more easily than balsa wood. It costs about 46 cents per sq. ft. for the ¼-in. thickness, 80 cents for ½-in. And considering what you can do with the material, they're not bad prices.

Everyone is familiar with the virtues of fiberglass-reinforced plastic: tough, waterproof, durable and almost completely maintenance-free. In normal fiberglass construction, however, you have to start with a complicated mold, and making this mold usually turns out to be at least as much work as building the project itself.

With Plyfoam, all you need is a simple form to hold the material to shape as it cools. Once shaped, the foam becomes a mold over which you apply the resin and fiberglass to produce a strong sandwich construction.

In addition to eliminating the need for a mold, Plyfoam makes a vital structural contribution to the finished project.

A single layer of fiberglass-reinforced plastic is flexible. To prevent unwanted flexing or "oil canning," the standard practice is to build up layers of glass until the required stiffness has been achieved. This is not only a lot of extra work, but it also makes the project much heavier and more expensive.

When used as the filling for a fiberglass sandwich, Plyfoam works like the struts of a steel bridge and produces an enormous improvement in strength-to-weight ratio. A sandwich panel of ½-in. Plyfoam between ⅛-in. layers of fiberglass increases the stiffness of the fiberglass by about 20 times. Such a panel will be stronger than high-grade plywood of the same thickness, yet weigh only about half as much.

Building a project with Plyfoam is simplicity itself. Normally, it

involves three steps: making a simple dimension control frame or shaping form; assembling the project in Plyfoam; covering the structure with fiberglass bedded in resin.

Forms and frames. Many simple projects can be built without any frame or form, since the Plyfoam sheets are quite rigid. For larger projects involving "cold forming" (bending the unheated Plyfoam to form simple curves), a simple wood frame is required. If no bending is necessary, this frame need only supply support points at 2 or 3-ft. intervals. If the Plyfoam must be curved, the support points will usually be spaced closer together.

A simple way to determine the proper spacing in such cases is to draw the curve full-size on a piece of lumber or plywood, then bend the Plyfoam sheet along this curve and tap small nails into the board to hold the sheet in place. This will quick-

ly fix the minimum number of constraining points necessary and the proper spacing between them.

Any old pieces of lumber will do for the frame, so long as they provide the proper support.

If the project involves compound curves, the Plyfoam will probably have to be heated, and this means that you must provide additional support to define the curve. Lath or 1-in. strips of $\frac{1}{4}$ -in. plywood, spaced about 2 in. apart and nailed over the frame where necessary, will prove sufficient.

The heated sheet will resemble a piece of heavy felt in consistency—carpet padding, for instance—and must be held firmly in position as it cools. Keep this in mind when determining the degree of support needed. Remember, however, that the frame can be very rough carpentry. The important thing is to provide the dimensions of the shape you wish to achieve, plus minimal temporary support for the foam sheet.

Working with Plyfoam. Almost any



SIMPLE FORM for bending foam into compound curves is slat construction with support at 2-in. intervals



HEAT FOAM one area at a time, working it down to conform to the curve, and anchor edges while it cools



FIBERGLASS CLOTH, precut to size, should be pressed into resin. If needed, brush more resin on dry spots



USE SQUEEGEE to press cloth into resin for thorough saturation, then remove any excess resin with it

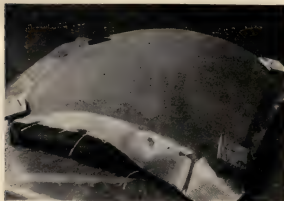
kind of knife may be used to cut the Plyfoam to the shape desired, though the ideal choice would probably be a shop knife with changeable blade. Just mark the outline on the foam sheet and run the knife along the line. You don't have to cut completely through the foam, since it will break cleanly in any direction once cut about halfway through.

Shaping is best handled with a Stanley "Surform" file, though any coarse file, rasp or even sandpaper will work. A portable saber saw can also be used. It's especially handy for cutting duplicate parts by making one pass through several stacked sheets.

Plyfoam joinery is such a simple operation that you find it difficult to believe until you've done it. Basically, each joint is held with a two-part epoxy glue. Ordinary toothpicks or annular-ring nails are used to hold the joint temporarily while the adhesive sets. You simply push these in with your finger. Once the glue sets, any protruding toothpick ends can be broken off flush with the surface. Nails



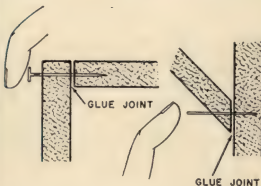
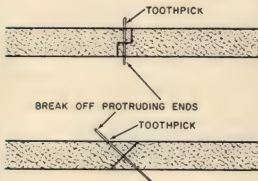
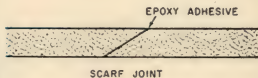
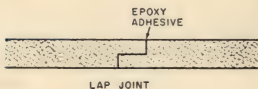
SPREAD RESIN evenly over the curved surface with a wide paintbrush before you add the fiberglass



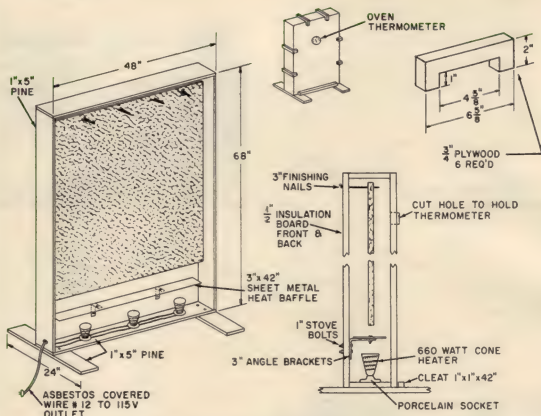
COMPLETED JOB should show texture of fiberglass cloth evenly. Excess cloth can be trimmed off later

NOV. 1965

Plyfoam Joints



Sheet Oven



NOTE: ALL INSIDE SURFACES TO BE
LINED WITH ALUMINUM FOIL,
POLISHED SIDE OUT. ATTACH
WITH STAPLES

should be countersunk and left in the work. The joint thus produced is stronger than the foam itself, and a fiberglass sandwich incorporating such joints is as strong as if there were a continuous core.

A simple butt joint is usually sufficient for edge-joining two sheets, though somewhat more elaborate joints are sometimes desirable when making up a large sheet from several small pieces.

Right-angle joints are made in the same way as flat butt joints, applying the adhesive first and pinning the two pieces together by pushing nails or toothpicks through the joint.

Another way of holding a butt joint while the adhesive dries is useful when fitting successive sheets to a frame. It involves looping a wire across the joint, pulling it flush to the foam surface and twisting the two ends together around a frame member under the joint. When the adhesive has set, the wire can be cut.

Where more strength is required, add a

fillet of foam. This will impart extra rigidity to a right-angle joint. It's also a good idea when mounting load-bearing panels, such as shelves or boat seats.

Heat-forming Plyfoam can be accomplished in a number of ways. Sometimes it's possible to form the desired curve by using a heat lamp, shaping one small area at a time. Hold the heat lamp a couple of inches away from the foam. Depending on the shape you want, this technique may even be used with large panels.

If the project is a small one, you can heat the sheet in a kitchen oven. And don't forget that almost anything can serve as a form—a box for a good 90° bend, for instance, or a can for a radius.

A "planking" technique is sometimes the easiest way to produce a large compound curve. By fitting strips together, one at a time, beveling the butting edges as required, you can produce extremely complex shapes using a heat lamp. Use

(Please turn to page 244)

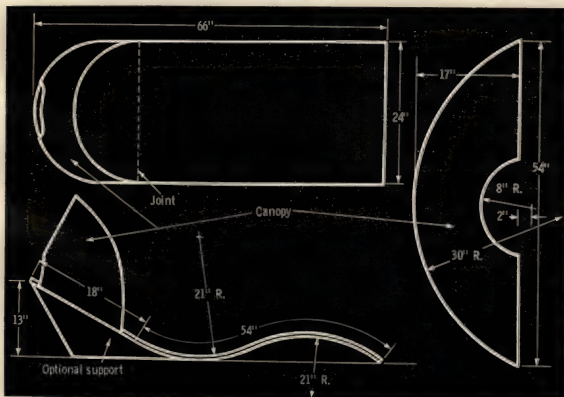


Project Ideas

Now you know how Plyfoam works—how its moldability banishes many of the restrictions that may have cramped your workshop style. And yet *because* it's so new and so unlike material you're familiar with, PM asked noted designer Franklyn Jacoby to sketch up a few projects that would test Plyfoam's design potential.

One of his projects—the hooded chaise you see here—was actually dimensioned and built as a practical demonstration. Other of Mr. Jacoby's ideas appear on the two following pages, reproduced directly from his sketch pad to springboard your own imagination toward the creation of projects that weren't possible before.

Hooded Chaise



5 wild and wonderful toys



ROCKING BOWL

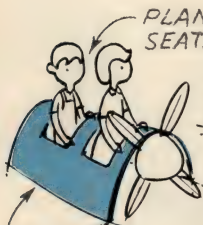
HILL FOR
CLIMBING OR
SLIDING

(FORM IT OVER
HOOD OF CAR?)



PLANK
SEATS

PIRATE
SHIP

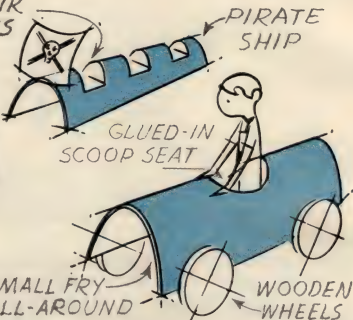


TRAINER
PLANE

GLUED-IN
SCOOP SEAT

SMALL FRY
ROLL-AROUND

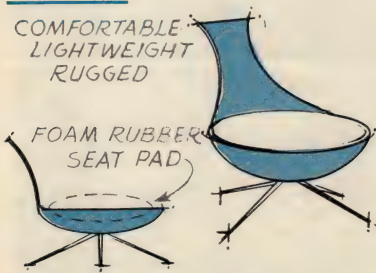
WOODEN
WHEELS



Easy chair

COMFORTABLE
LIGHTWEIGHT
RUGGED

FOAM RUBBER
SEAT PAD



WELDED IRON
ATTACHED TO
INSET WOOD
BLOCK



SOME BODY VARIATIONS

Carts a-go-go



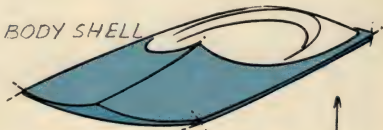
WATER SLED

FABRIC AND
ALUMINUM TUBING
TOP---



TOBOGGAN

BODY SHELL

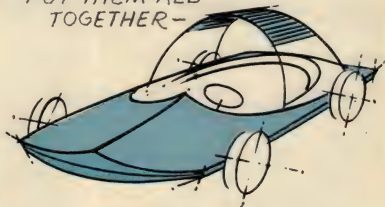


SOAP BOXER



CHASSIS PAN

PUT THEM ALL
TOGETHER--



--FOR THE RACIEST THING
ON WHEELS



SURFER



GOLFER



Boat Building

Plyfoam is an ideal material for building boats, not only because of the general construction advantages mentioned earlier, but because it provides built-in flotation, like wood.

As a matter of fact, the material was originally developed for use in boat construction. John T. Potter, president of Potter Instrument Co., Inc., and an enthusiastic yachtsman, heard about PVC

foam in Europe. Upon further checking, he learned that B.F. Goodrich had a strong background in the field of foam plastics.

Potter went to Goodrich with his requirements—a PVC foam with thermoplastic characteristics, density and strength suitable for marine construction—and the result is a jointly operated development program is Plyfoam. Plyfoam, Inc., is the company founded by Potter to market the



SEA SHELL PRAM KIT includes all the necessary parts for the boat and frame, precut to the proper size



BUILDING FRAME is assembled on a single 2 x 4 and rests on two sawhorses. The floor should be level



WORK QUICKLY when applying resin and cloth. Use squeegee to remove wrinkles, work out trapped air



AFTER RESIN CURES, lift hull off frame and place it in a simple cradle while you glass the interior

new material, manufactured by B.F. Goodrich exclusively for this company.

Touche III, the first boat built from Plyfoam, is a 37-ft. trimaran with a beam of 20 ft. Designed for Potter by Britton Chance Jr., it weighs only 5000 lbs. and carries a 1200-lb. keel. Under ideal conditions, it can beat any America's Cup 12-meter. You'll find a picture on page 248.

While many boat companies expressed immediate interest in Plyfoam for production boats and are now engaged in design research work with it, the first Plyfoam boats to be made available to the public are two kits from McNair Boat Works,

Inc., 27 Munson St., Port Washington, N.Y.

The largest is a 15-ft. 6-in. runabout OBC rated for 95 hp and weighing about 400 lbs. It's shown on page 248.

The other is an 8-ft. Sea Shell pram, construction of which is illustrated below. A 40-lb. lightweight, it's the kind of small utility craft that you can toss on top of your car or into the back of your station wagon. The \$116.50 kit includes all the necessary Plyfoam parts, precut to size, plus fiberglass cloth, epoxy resin and fittings. In addition, it contains all materials required for the simple building frame.

(Please turn to page 249)



POLYETHYLENE SHEETING stapled on frame acts as separation membrane to simplify removing hull later



AFTER ASSEMBLING hull with push pins and glue, the edges are rounded so fiberglass will adhere well



SEAT SUPPORTS and transom inset should all be added before you begin fiberglassing interior of hull



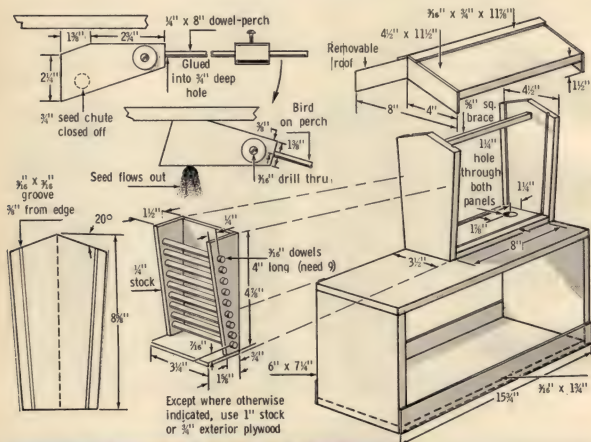
COMPLETED PRAM has all the virtues of fiberglass construction, yet weighs less than stock glass pram

BIRD AUTOMAT

By P. T. Hennig

YOUR FEATHERED FRIENDS need no nickels to serve themselves at this automat. They only have to discover that when they light on the perch, seeds are automatically dispensed down a chute and onto the feeding table. Since the seeds are

stored "upstairs" in a hopper with a removable roof, they keep dry, and won't blow all over the yard. In watching the birds, you'll be surprised how quickly they catch on in getting themselves extra helpings. The suet provides dessert.



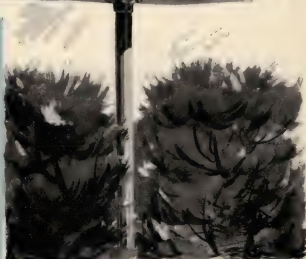
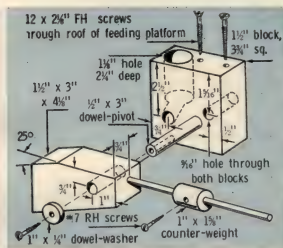
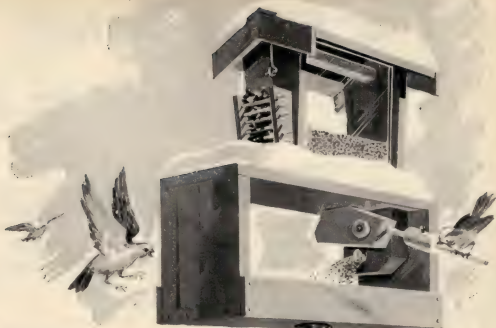
TAKE A HINT FROM READERS



CLAMP A PANTS HANGER across the corner of a square as shown and you can mark off a series of identical angles, as in laying out stair stringers or rafters. Felt pads inside jaws keep the hanger positioned as it rides along edge of stock.—Ken Patterson



EMPTY SHOTGUN SHELLS can be neatly stored in cardboard milk cartons until you accumulate a batch for reloading. Each carton holds a generous supply and a number of filled cartons can be stored compactly on any convenient closet shelf.—John Krill



WHEN STEADY HANDS are needed for a delicate job (such as inking a drawing pen) press the tips of your little fingers together as shown and pivot your hands from the wrists for whatever movement is required by each of the other fingers.—Bob Gilmore



DOLL BABY BOTTLES make fine dispensers for small quantities of glue, letting you buy an economical supply to divide up for many jobs. The hole in the nipple lays a delicate pencil-line of glue when you squeeze one of the plastic bottles.—Frank Bartonek

Is Your Run-off System Doing Its Job?

Every part has its function: Flashing should see to it that rain does run off, not through cracks at chimneys and roof joints. Gutters and downspouts must then carry the water quickly away from the house. Here's how to check your system—and how to improve it with new materials and techniques

YOUR HOME is under constant attack. Nature is fairly relentless in her attempts to wash it away with rain or bury it under snow. Fingers of moisture are forever probing its weak spots in hopes of emplanting mildew and rot. Your roof must ward off thousands of gallons of water each year.

And now's the time—between the bombardments of summer thundershowers and of winter sleet—for you to take stock of your home's first line of defense—the flashing and guttering that channels all this water safely away from the house . . . or *should*. The whole "chain" is only as good as its weakest link. If your flashing has deteriorated or is no longer tightly sealed at the edges, you're in for trouble upstairs, at the first sign of a thaw. If you've let sags or leaks develop in your

gutters so that water stands in them and trickles down your siding, you may have a paint-peeling problem next spring. Or if you merely let autumn leaves fill your gutters and clog your downspouts so that the water backs up and spills over to soak into the earth around the foundation, you're asking for a wet basement.

Also, by running a check at least once each fall, you can catch any problems in the system itself that might result in a replacement bill of several hundred dollars if they went undetected.

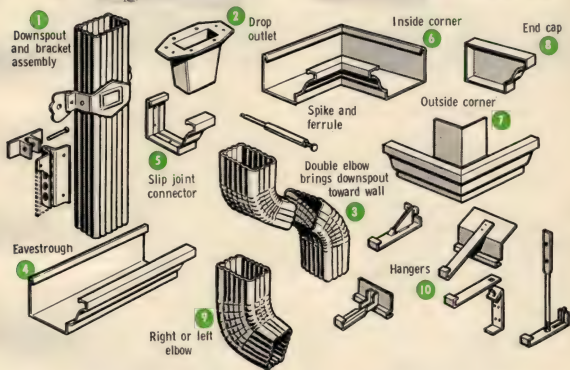
It's tough to quote exact figures as to what a replacement system can cost. There's a wide range in gutter quality, and prices vary from area to area. Our chart on page 161 is only intended to offer a general comparison of costs; we've attempted to reflect a national average in



CHECK SPLASHGUARD at each downspout to be certain water is draining well away from foundation. Dispersal devices can be substituted for splashguards



DRILL-POWERED WIRE BRUSH is ideal for polishing rusted gutters down to sound metal, for repainting or patching. Use grounded extension cord outdoors



PATCH WON'T STICK to surface coated with loose particles. Most efficient means of assuring clean surface is to drag a small vacuum cleaner up there

NOV. 1965



APPLY EVEN, HEAVY COAT of roof cement over damaged area, then press piece of heavy aluminum foil into place, follow with another good coating of cement



CHECK DRAINAGE of eaves by pouring bucket of water in at midpoint, watching to see how quickly it flows toward downspout. It shouldn't "puddle"



GUTTER SCREEN is easiest of all leaf guards to install; it's aluminum, so cuts with scissors. Tuck one side under shingles, insert other into gutter lip

our price figures. But it's important to bear in mind, as you check your present gutters, what types are available if replacement proves necessary.

It's generally agreed that the biggest maintenance headache is provided by old-style wood gutters. Unless they're cared for regularly—at least once a year—they can rot. And once rot starts, replacement's not too far behind, because piecing in a

new section is seldom practical.

If your home is equipped with wood gutters that are fairly new, you might consider a bit of *preventive maintenance* to make them last: If the inside surface of the guttering has never been treated, you can line it with fiberglass, as shown in the photo below, left. The cloth is available in rolls of various widths and the resin you'll need to cement it in place can be



CUT,
FOLD,
TAPE

GUTTERS &
FLASHING

FIBERGLASS CLOTH laid in a bed of resin and with a second coat brushed over it, creates a permanent patch for a large deteriorated section of gutter



MAINTENANCE-FREE system has all components made of rigid white vinyl plastic—assembles much as metal systems do, except joints (as above) are cemented



ANOTHER TYPE OF GUARD is rigid aluminum sheet stamped into rows of tiny louvers. Tabs on outer edge clip onto gutter lip to keep guard from lifting



CAGE-TYPE STRAINER may be required in downspout opening, especially with uncovered gutters, to keep leaves and other debris from clogging the downspout

purchased at any boating suppliers. The job requires careful preparation, since the cloth won't bond to anything but a clean, raw-wood surface. Scrape the trough down with a wire brush and make certain all loose particles are then swept away or vacuumed up. Apply the first resin coating, line the trough with cloth and brush on a final resin coat.

A less expensive treatment for raw wood gutters—but one that must be repeated annually—is two or three coats of linseed oil. Many gutter specialists prefer this to the special gutter *paints* which, they claim, tend to impede water flow. However, if your gutters have been previously painted inside, repainting is the

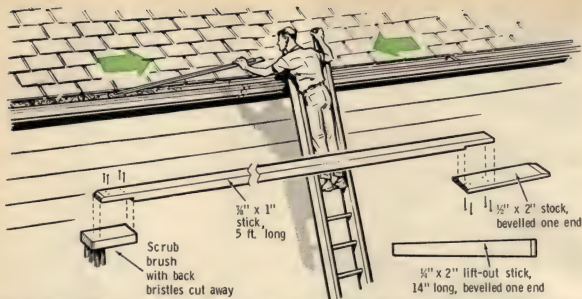
only maintenance possible.

Metal gutter systems are generally more practical, but there's a big range in types and costs. First of all, there are two standard shapes—half-round and box. The latter is also called "K" or "OG" and is available in two sizes, based on the top width of the trough. The choice of size depends on the type of rainfall common to your area. If your home has a fairly large roof area and is subjected to frequent heavy downpours, you'll probably need 5-in. guttering to prevent overflow. If light rain is more characteristic of your weather, the 4-in. size will suffice.

Until recently, the standard metal gutter was galvanized steel—but this requires

COST COMPARISONS BY COMPONENT

Type of System	4"				5"			
	Down Spout 10 Ft.	Eaves-trough 10 Ft.	Corner	Elbow	Down Spout 10 Ft.	Eaves-trough 10 Ft.	Corner	Elbow
Half-round Galvanized	-	-	-	-	\$ 1.35	1.35	70¢	40¢
Box Galvanized	\$ 1.55	1.45	79¢	40¢	1.55	1.75	89¢	40¢
Box Aluminum	-	-	-	-	1.69	2.45	95¢	39¢
Box Enameled Steel	2.59	2.55	98¢	49¢	2.59	2.75	1.10	49¢
Box Enameled Aluminum	-	-	-	-	2.85	3.50	1.25	59¢
Box Vinyl Plastic	4.80	5.50	1.32	88¢	4.80	7.20	1.65	88¢



CLEAN 14 FEET OF GUTTER from one ladder position by making this simple double-end stick. It works just as well with bridge-type hangers—you push the debris at the limit of your reach under the hanger, to be pulled toward ladder in its next position. Use short stick for lift-out at ladder where long one's awkward

consistent maintenance to prevent rust. For this reason, aluminum guttering has been steadily gaining in popularity. Aside from higher cost, it has only one disadvantage: though not subject to rust, aluminum won't hold up well in areas close to salt water or heavy industry. So if you live where there are ocean breezes or chemical smog, you'd have to give exposed aluminum at least as much care as you'd give galvanized steel.

And you can't paint new aluminum gutters the minute you put them up, since the metal must form an oxidation coat before paint will adhere. Since this takes about six months, corrosion from air that's laden with salt or chemical waste could be well advanced before you dared apply paint. And even then, it's unlikely that,

however carefully you brushed, you'd get a perfect sealing coat.

For just such problem areas, a pre-finished aluminum gutter was developed. It has a baked-on plastic coat that makes the metal impervious to rust or corrosion. The disadvantage here is considerable advance in price.

Gutters are also made of copper, but this is usually a custom, luxury installation, out of the do-it-yourself realm.

The newest gutter-and-downspout system to reach the market involves no metal at all except for hangers and brackets. All water-carrying components are molded from rigid white vinyl plastic and are solvent-cemented together at the time they're installed. The system will last the life of the house with *no* maintenance beyond



HOW TO PATCH A DOWNSPOUT LEAK

Since there will be little pressure against the patch, you can repair a downspout leak with weatherproof self-adhesive aluminum foil tape, developed by Johns-Manville. First (far left) clean the area with fine steel wool, then measure off the length of tape needed and cut it from the roll. Finally press firmly over area with blunt tool

the usual clean-out. The tough material won't chip, dent, wear away, warp or sag; nor will it support fire or conduct electricity. It also reduces the noise level of water flow. Originally introduced as a 4-in. system (in the standard box shape), vinyl gutting has just been made available in the 5-in. size.

There are only two possible disadvantages to this material. Vinyl is substantially more expensive than other gutter or downspout systems, and it is available only in white. You could of course paint it to match a colored siding or trim, but you'd then be introducing a maintenance problem. Of course, repainting in this case would be strictly for looks, since the paint wouldn't be offering protection.

So much for the range of choice you'll have if gutters need replacing, or if you build a new house. (Incidentally, if you're planning an addition, don't use a different type of gutter along the new roof. Should you ever tie aluminum into a steel system, for example, you'd be inviting corrosion.)

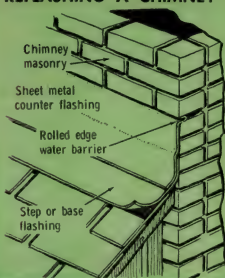
Now let's climb up for a look at your present gutters. Whatever the type of system, it can't do its job if it's clogged with leaves and other debris. Not only will water back up and overflow; a mass of soggy leaves is heavy, adding weight the gutter hangers weren't designed to support. This can cause sagging, and it's much easier to clean a gutter out than to re-pitch it.

Proper pitch (about $\frac{1}{16}$ in. per running foot) is vital in wood and steel gutters, less important with aluminum and plastic, where standing water won't cause deterioration. However, prolonged "puddling" can invite stagnation and insect breeding, so it's always best to keep the run-off flowing. Checking pitch is easy: just pour a bucket of water in the trough and watch how it drains. If it puddles in one spot, adjust the hanger nearest that spot to raise the gutter.

The ease of this job depends on the type and number of hangers you find up there. Hangers are usually placed about every three feet, and maybe your sag problem results from too wide a spacing. In such cases, adding a hanger may correct the sag.

The many varieties of hangers (and we've only shown a few on page 159) break down roughly into two categories—those that nail to the fascia board or rafter ends, and those that drop from the edge of the roof because there is no fascia or exposed rafter to nail into. The latter types have a vertical rod with a flattened end which must be bent to conform to the roof pitch. The bent end is then anchored under the first course of shingles. Whatever the hanger design, it must be of the

REFLASHING A CHIMNEY



TO KEEP JOINT SEALED between wooden roof and masonry projecting through it, flashing anchored to roof and that attached to chimney are separate pieces



SHEETMETAL FLASHING had opened at corner seam and top mortar joint was crumbling, so black plastic cement should be liberally applied at critical points



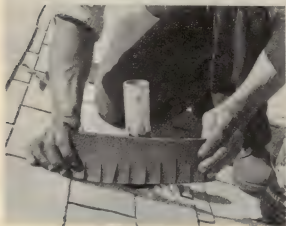
TO REINFORCE leaky flashing, wrap asbestos felt or fiberglass around it, cut to conform to roof angle. This is easier with several pieces, lapped at corners

REFLASHING A VENT PIPE

VENT PIPES are too rigid to accommodate themselves to a house's settling. To reseal gaps between pipe and base, apply plastic cement

MAKE SERIES OF CUTS along one edge of asbestos felt or fiberglass flashing strip and draw it around base, seating it in cement

WRAP STRIP TIGHT, pressing tabs firmly into cement and overlapping ends. Follow with a top coating of cement for a waterproof seal



same metal as the gutter, and should be attached with nails of the same metal.

Hanger adjustment isn't, of course, possible with wood gutters, which are nailed right to the fascia board through spacer blocks. Correcting pitch involves knocking the gutter loose and renailling. If you try this, be sure to replace those spacers; without 'em, water can seep up under the

shingles and drain down inside the wall—or at least drain down the joint between gutter and fascia, inviting mildew and rot.

If clean-out is a chore you'd rather avoid, those gutters should all be capped with a guard that lets the water through but screens out debris—leaves, twigs, bird nests and anything the kids might toss up

(Please turn to page 210)

FLASHING A ROOF JOINT

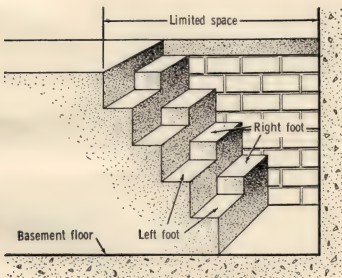
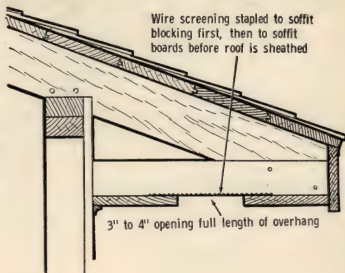
Any break in the shingle treatment—as in a valley where two roofs meet, or where there's an offset roof, as shown below—presents a potential leak problem. The answer is always flashing. To seat a strip of asbestos felt across the gap, first apply black plastic cement, extending about two inches on either side of the joint. Press the material firmly into the corner, trimming ends as needed and taking care that ends are anchored



Clever Solutions to Building Problems

Soffit Venting

When building a shed or other small structure, you can provide low-cost ventilation by using edge trimmings from fly screen for cornice soffit venting. Just staple strips of screen to soffit framing midway between wall and edge, install soffit boards, leaving screen exposed and staple edges of screen to soffit boards before applying roof sheathing.

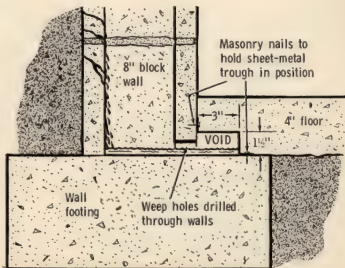


Space-Saving Stairs

Don't settle for steep, hard-to-climb stairs in cases where horizontal space is limited. Instead, construct your stairs with two risers per step forward, as shown at left. This same design will work just as well in wood, and might come in handy for stair access to an attic through an existing closet.

Hidden Basement Gutter

If you're building a house with a block foundation, have a local sheet-metal shop make up troughs, as shown at right, and install these on top of the footings next to the walls before the floor is poured. These should lead to a sump. Such a drainage system will take care of any seepage which runs down through the hollow-core blocks.



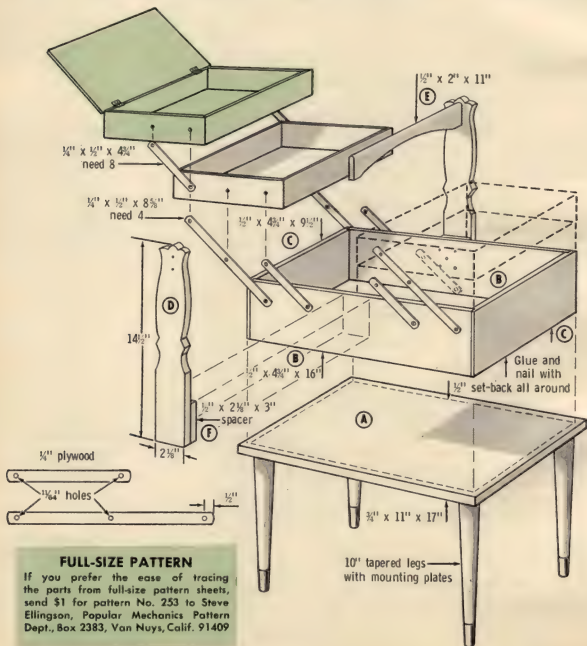
Swing-Out Sewing Caddy

IF THIS CABINET could reach out and hand you the very sewing item you're looking for, it couldn't be more helpful. For when it's swung completely open, the entire contents are immediately displayed, in neat regimental array, for easy selection. When closed, its linked-together trays stack into a neat storage stand, with a pick-up handle that lets you tote your whole sewing center to your favorite chair or the best light for working.

The bottom compartment has plenty of space for patterns, fabrics or bulky yarns.

The four smaller trays store threads, scissors, needles, buttons—and all the other small items that get lost in a conventional drawer. The trays can be further compartmented to suit your supplies.

Stack the trays to form a box and position the links, driving tacks through their holes into parts B and G; then swing each section open to see if the links offer proper support. When adjustment is set, drill pilot holes in B and G. After finishing, drive $\frac{3}{4}$ -in. No. 8 r.h. screws so they're snug but don't prevent pivot.—*Steve Ellingson*

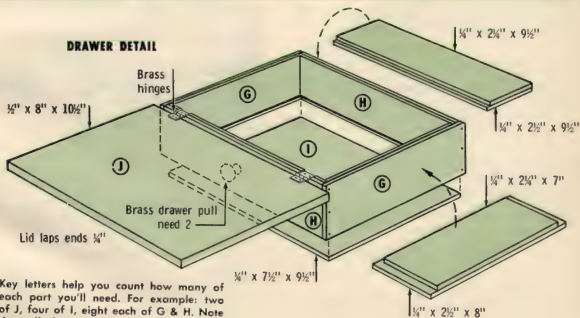


FULL-SIZE PATTERN

If you prefer the ease of tracing the parts from full-size pattern sheets, send \$1 for pattern No. 253 to Steve Ellingson, Popular Mechanics Pattern Dept., Box 2383, Van Nuys, Calif. 91409



DRAWER DETAIL



Key letters help you count how many of each part you'll need. For example: two of J, four of I, eight each of G & H. Note that all the rabbets can be formed by gluing two plywood pieces face-to-face

1" squares



HOME PROBLEMS

1. WALL CADDY for table-tennis paddles and balls can be made by mounting a ball rack on an ordinary clip board. Paddles slip under clip, which may be padded with strips of rubber or felt, if desired

2. SELF-LEVELLING shelf for any hollow-rung metal ladder swings freely on a 1-in. dowel inserted into end of rung. A 9 x 12-in. shelf will be large enough to hold most paint cans, brushes and tools

3. WHEN SQUEEZE BOTTLE of glue is almost empty, turn it upside down and store it in a tool rack. This keeps the glue up top, ready to use, and does away with wait while glue is squeezed up to the spout

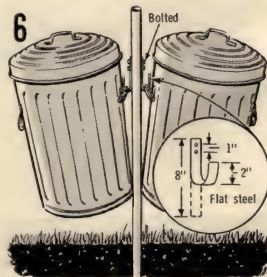
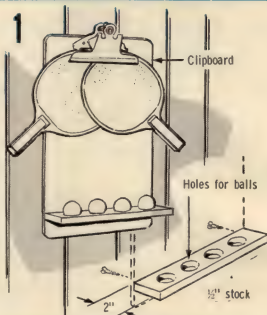
4. IT'S EASIER to remove nut meats whole from their shells if the nuts have soaked overnight in salt water before cracking. The water expands the shells, while the salt prevents the meats from losing flavor

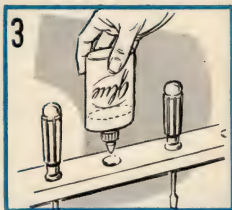
5. POURING SPOUT for dry materials is a handy addition to mason jars in which salt, sugar, flour, etc., are stored. Just cut the top from cardboard container in which salt is sold and mount it with a jar ring

6. POLE HOLDER designed for two garbage cans not only doubles life of cans but defies overturning by wind or animals. Place hooks to hold cans 6 in. above ground and drill drainage holes in can bottoms

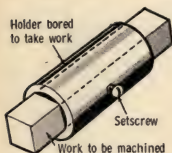
7. ARTISTS' BRUSHES will last longer and stay softer if you smooth the bristles to a point with petroleum jelly after each cleaning. Naturally, each brush should be thoroughly cleaned right after you use it

8. DECORATIVE PANEL to relieve the monotony of a long panelled wall can be made by mounting patterned perforated hardboard on wall and framing it with molding. Use contrasting color on background





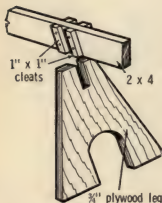
TAKE A HINT FROM READERS



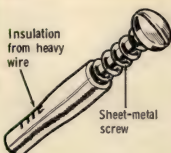
SAVE CHUCKING TIME when drilling and tapping ends of mass pieces of square stock by boring out round rod for snug fit for square rod, adding a set-screw and chucking the fixture in lathe



STEEL WOOL makes an efficient throwaway grit catcher for the exhaust chute on your bench grinder. A wad of it stuffed into the chute will trap grit while allowing air to pass through



COLLAPSIBLE sawhorse made from a length of 2 x 4 and $\frac{3}{4}$ -in. plywood is strong and sturdy but comes apart easily for storing. Make it as shown, with dimensions to suit your needs



YOU CAN IMPROVE a screw anchor from the insulation on No. 6 or 8 wire by snipping off a 1-in. length, pushing out the wire core and placing the insulation sleeve in hole in wall



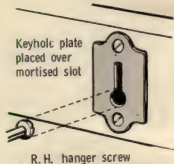
PADDED MEMBERS on a sawbuck will prevent skinned knuckles when sawing firewood. Pad them by tacking pieces of inner tubing over the ends of the crossed uprights of the log cradle



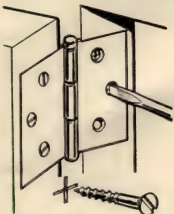
WHEN SPLITTING wood with a wedge and sledge, the wedge often becomes jammed in the log. If this happens, use another wedge to split one side of log and free bound wedge



IF YOU BREAK a $\frac{1}{8}$ -in. drill bit, you can make an excellent on-the-job substitute from a spiral nail. A headless floor nail chucked into the drill works great even in drilling hardwood



HIDDEN HANGER for a picture frame can be made by mortising a vertical slot in the center of the frame and covering this with an inverted keyhole plate to fit over hanging screw on wall



SCREWDRIVER blade which matches the diameter of holes in hinges is the perfect tool for marking drilling centers. Tap it once, turn and tap again. The "X" produced marks the center

NEW FOR CAMERA BUFFS

BY ROBERT B. BERGER



You can carry your camera or binoculars comfortably and securely—even at a trot—with the Camera Caddy. This heavy-duty elasticized strap holds the camera under tension to prevent swinging and dangling, and also helps to steady the camera for sharp, hand-held shots. It is available in most photo shops for \$3.95. Sloan Marketing Corp., Ardmore, Pa.



Small accessory with a long name is the Schiansky Staticfix shoulder brace. Though not intended as a substitute for a tripod, the brace lends a great deal of support when shooting with heavy telephoto lenses. When not in use, it may be folded and carried in the pocket. Cost is \$5.95 postpaid from Uniphoto Inc., 1270 Broadway, New York, N.Y. 10001.



Any focal length from 85 to 210mm can be set when you use the Sun Zoom lens. The lens is only 6¾ in. long and weighs 20 oz. Maximum aperture is f/4.8. A complete line of adapters is available so that the lens may be used on any 35mm SLR having a focal plane shutter. Priced at \$99.95 with case and lens shade. Spiratone Inc., 135-06 Northern Blvd., Flushing, N.Y.

NOV. 1965



Candid shots are a snap with the Olympus Pen W. This compact, half-frame 35mm camera is fitted with a 25mm f/2.8 wide-angle lens; shutter speeds range from 1/8 to 1/250 sec. Special features include a luminous frame viewfinder, visible from edge to edge even when wearing eyeglasses. The price is \$49.95. Scopis Inc., 257 Park Ave. South, New York, N.Y.

Pattern Your



W. Clyde Lammey

AT THE PATTERN BOARD shot charges that register consistently high, low, right or left of center can tell you a story of shotgun fit. In practice you don't aim a scattergun as you do a rifle and this is why correct shotgun fit is just as essential, perhaps even more essential to high score shooting, as is rifle fit. In shotgun handling one must move fast. Only speed, coordination and proper gun fit count when at most you have only seconds to get off a shot that connects. This is why one should pattern every shotgun he owns, whether these be newly acquired, or old, untested favorites.

If, for example, you are shooting a scattergun with a stock a bit too short for you, you may find on pattern-board testing that the charges register consistently to the right of center and possibly a little low. On the other hand, if the stock pull length is greater than you require individually, you may discover that the charges tend to pattern a little to the left of center and likely a trifle high, assuming, of course,



FIRE ONE SHOT at each patterning sheet, then either count number of pellet holes at the time, or number or otherwise mark sheet for later reference



ALTHOUGH STANCE is important, it should be relaxed and natural as suits individual, forward knee slightly bent, cheek well down on comb. Wear field clothing

Shotgun

When you swing your shotgun on live or clay birds it's important to know where the shot charge goes

you are right-handed. In either case the bird is likely to be caught in the fringes of the shot pattern or may be missed entirely. If the stock drop is too great, you may find the charges landing consistently low and if the stock is too straight for you individually, the charges may register consistently above center. There are, of course, other factors governing gun fit but these variations usually are considered primary.

Patterning is a simple procedure but one must be prepared to burn considerable ammo in order to arrive at definite conclusions. You'll need the pattern board and quite a number of sheets of paper roughly of the size and dimensions detailed, the paper sheets each having a bull's eye or bird outline as an aiming point. The pattern board should be set up before a steep slope or in some other location where it is safe to fire a shotgun. A distance of 40 yds. from the pattern board is the generally accepted range for testing full choked 12, 16 and 20-gauge shotguns. The smaller



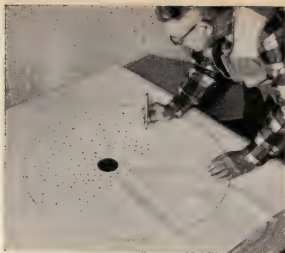
SIMPLE SETUP for firing from rest. As safety measure when firing varying gauges use varicolored shells, red for 12, blue for 16, and yellow for 20 gauge



ANOTHER VIEW of what is generally accepted as proper stance for offhand firing at pattern board. Dry firing can be of help in taking the stance quickly



TO DETERMINE pattern uniformity, also percentages, scribe a 30-in. diameter circle around greatest concentration of pellet holes. See detail for scribe



CHECK NUMBER of pellet holes inside circle, using felt marker, counting as you go. Number of pellets may vary shot to shot, but average should be fairly close

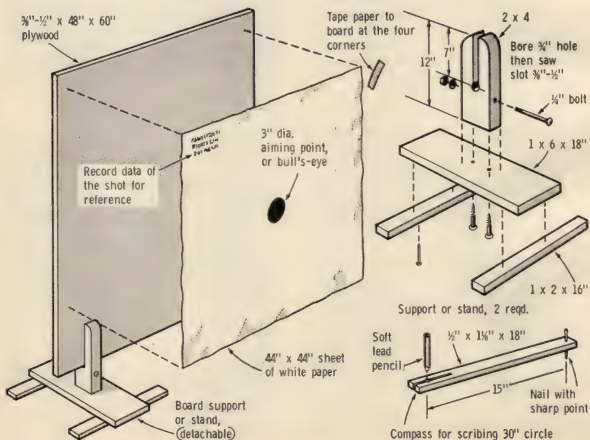


IF YOUR GUN STOCK is too short you may find shot charges registering consistently low and perhaps a little to the right as indicated by this pattern

gauges, 28 and 410 bores, also the more open borings in the larger gauges, are usually tested at shorter ranges. Make a mark or drive a stake at the 40-yd. firing position. Don the clothing you normally wear afield, for the first tests a light hunting shirt and jacket.

Move diagonally away from the stake a few steps to the right or left, then turn and approach the stake with the gun in the

field carry position. On reaching the firing point mount the gun and fire quickly, without "aiming," just as you would at a moving target. The first trials of this maneuver may be difficult to bring off consistently as you will be more fully conscious of the gun, the target, and also of the fact that in this procedure the factors of gun swing and lead have been eliminated. But if one persists—dry runs may

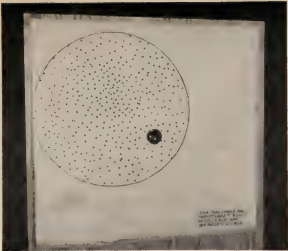


help—in the maneuver, it's possible to duplicate a typical field stance and to carry out gun mounting and pointing with a consistency and accuracy sufficient for the purpose. Fire only one shot at a time and carefully note the position of the charge as tagged by the pattern paper. Then remove the paper, replace with a fresh sheet and repeat the performance until a consistency in placement of the charges becomes unmistakably evident. All charges may continue to land on center—allowing for inaccuracies in pointing—or they may tend to land right, left, high or low.

Before you make any corrective stock alterations, such as lengthening or shortening the pull length, or raising or lowering the comb height, change to heavier clothing such as you would wear in cold weather, and run another series of test shots. It's likely you will turn up some variations, using the same gun and ammo. As an example, if your gun places its charges consistently to the right and low you may discover that when you don heavy clothing the charges tend to land on center, give or take a little. In this case the extra thickness of heavy clothing has, in effect, lengthened the stock. Should the stock be a little too long, you may find you're throwing charges halfway off the board when you're heavily clad. Usually there's less variation when the gun tends to throw charges high or low of center consistently, but you may detect some variable even here when comparing the effect of light and heavy clothing.

On discovery of any of these variations you have two corrective choices: either alter the stock as required or adapt your shooting practices to correct the tendency. The latter can be done with practice in handling. You can raise the comb if required with a lace-on type pad. The stock can be lengthened with spacers placed under the buttplate or butt pad. Other stock alterations involving reworking the wood, such as thinning the comb, should

(Please turn to page 209)



ON OTHER HAND, if shot charges consistently land to the left and high, the stock may be too long for you individually. Gunsmith can correct at nominal cost



PATTERN showing uniform distribution of pellets from 20-gauge modified choke barrel at 35 yds. Concentration is to left, likely a pointing error



PATTERN FROM 410 BORE insert in 12-gauge full choke barrel at range of 25 yds., using No. 9 shot size. Charge is centered and rather tightly concentrated

AVERAGE NO. OF SHOT PELLETS IN COMMON LOADINGS*

	Weight of charge in ounces				
Shot Size	$\frac{3}{4}$	$\frac{7}{8}$	1	1½	1¾
9	439	512	585	658	731
8	308	359	410	462	512
7½	263	305	350	394	438
6	169	197	225	254	281
5	128	149	170	191	213
4	101	118	135	152	169

*Figures are only approximate for the number of pellets for each shot size.

Motorized Humidifier

Furnace humidifiers are seldom part of the they're usually the better-than-none plate type. matic humidifier that requires only minimum

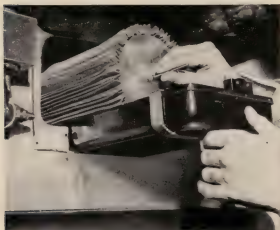
By Frank L. Greenwald

MOST FORCED-AIR FURNACES that come with any humidifier at all are equipped with the simple evaporative plate type which is the least efficient of the many in-plenum designs available. It consists of stationary blotter-like plates that suck moisture up from the water pan they stand in. The theory is that exposing all these moist surfaces will help the hot air pick up water vapor as it passes. The trouble is that these plates quickly clog with mineral deposits—especially in hard-water areas—and the amount of moisture they supply is woefully inadequate for most homes.

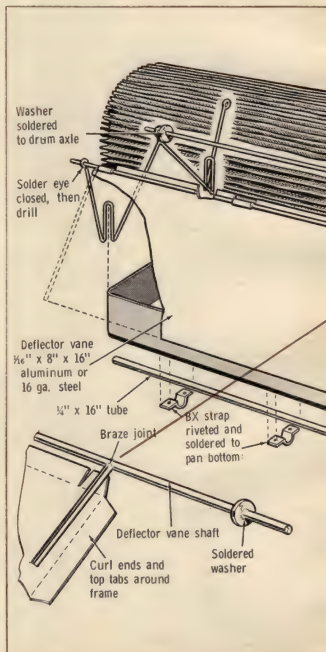
The result? The dried-out air that flows into your rooms is so thirsty it grabs moisture from everything it touches: furnishings, fabrics—and *you*. Rapid evaporation from your skin makes you feel so cold you turn up the thermostat—and up goes your fuel bill, as well. (For a full discussion of the need for home humidification, see "There's Danger in Desert-Dry Air," page 158, Dec. '63 PM.)

What's needed in every forced-air furnace is a constantly replenished supply of moisture, and one of the best ways to provide this is by means of a drum that rotates through a reservoir, picking up droplets of water—a drum through which the hot, dry air can readily pass on its

way from the furnace to the rooms of your home. Hot air can hold a lot more moisture than cold, so the heated air your furnace sends out needs access to a large amount of water. But air can suck up moisture only by direct contact, and the *more* contact you make possible, the more moisture



INTO THE PLENUM of your furnace goes a pleated-screen drum that turns through a water pan to lift moisture—by evaporation—into the warm air stream



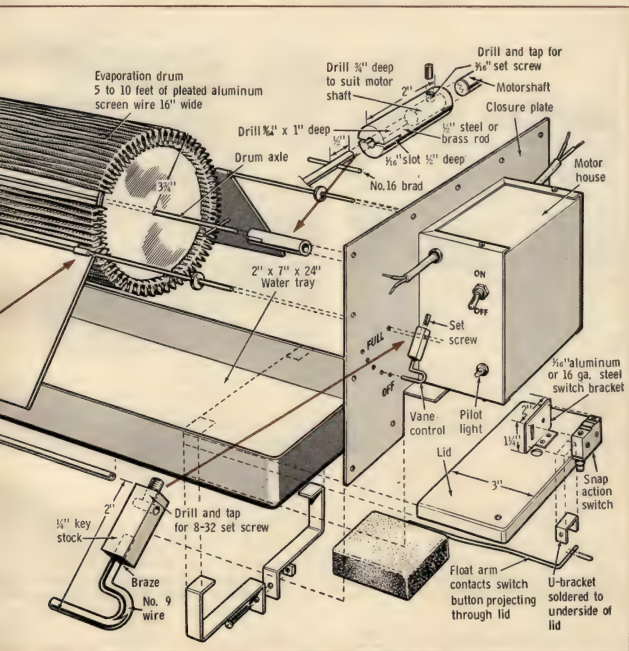
for Your Furnace

original installation and, where they are, Here's your chance to own an efficient auto-attention to keep heated air properly moist

the air can absorb. A plain pan of water presents only an inert surface, and relatively little air actually touches it. But when you direct a great mass of heated air through a constantly-replenished mesh of droplets, the air's ability to absorb is much increased. And the *more* moisture it

picks up in the plenum, on its way to your rooms, the less it will need when it arrives there. Of course, if you begin to find condensation on your windows, you must be able to *cut down* on your "moisture supplier" to avoid air that's too wet.

This principle is behind the humidifier



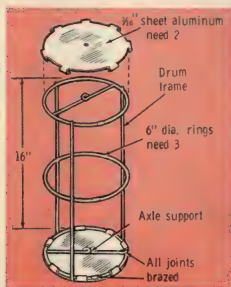
HOW TO MAKE THE EVAPORATIVE DRUM



CARDBOARD TEMPLATES have circles marked off in three equal segments to serve as both bending guide (left) and assembly jig (right). Drum frame is No. 9 galvanized steel clothesline wire; bend three rings, snip off excess and braze butted ends before joining rings to struts held by templates and rubber bands as shown



FOLD ALUMINUM SCREEN into $\frac{3}{8}$ -in. pleats, working toward center from each end. Note masking tape folded over raw edge to protect hands. Remove it before interlocking end pleats and fastening every inch with desk stapler. Slip resulting sleeve over frame, taking care not to stretch any more than necessary



that's shown here, and you can make it in a couple of evenings for a few dollars. It's capable of putting five to ten gallons of water a day into the air, and of raising the relative humidity in a seven-room ranch house to 35 percent at 74° in zero weather. What's more, it'll more than save its cost in one heating season by eliminating the purchase of new evaporator plates.

A drum covered with five to ten feet of pleated aluminum screening rotates at about 14 rpm in a water tray you'll probably be able to salvage from your present plate-type humidifier. Deflector vanes on each side can be adjusted to channel a certain portion of the forced air in at the sides of the drum and out through the top. A simple float mechanism operates a water valve by means of a snap-action switch, to keep the reservoir properly filled. And the drum motor only comes on when the furnace blower is operating.

There are no critical dimensions in the plans

presented here. The size of the components can be altered to suit individual needs. The *amount* of screening—in other words, the total number of pleats—isn't as important as the size of the drum frame. We tried two different drums of the size shown at lower left—one with five feet of screen, the other with ten; both had about the same evaporative rate.

If you can use your present furnace pan, and it has a float and valve in good working order, you've got a head start. Otherwise, you'll need a solenoid-controlled valve—such as one from an automatic washer. The valve shown in the photos was a homemade job, and I'd just finished it when I learned that local appliance repair shops could supply "half-good" valves for next to nothing! I have several with inoperable hot-water valve positions but a cold-water solenoid that works just fine. Such a valve would be ideal.

Start construction with the drum, after measuring your plenum and pan to determine the best size. Solder the drum to a clothesline-wire axle, allowing extra length at each end which can be trimmed off after fitting the drum in place. Finish the drum by closing each end with aluminum baffles to force the air-flow up through the moisture-laden screen. These are attached by friction tabs only.

Since my furnace pan had a porcelain enamel coating, I bent up a rear support bracket that would simply clip over the end without disturbing the rustproof finish. Solder a washer to the axle to act as a stop that prevents the drum from contacting this support. Trim the axle to within an inch of this stop.

My pan was equipped with a lid over the 3-in. portion that projected from the (For installation photos, please turn page; text continues on page 240)



WATER-LEVEL CONTROL consists of Styrofoam float on arm positioned to contact button of snap-action switch mounted on lid of water pan. Arm is locked in pivot bracket with a U of wire through two holes



TWO-PIECE CLAMP is made from strip aluminum to hold part-lid on porcelain enamel pan. Join halves with bolt, slip clamp in place, tighten bolt. Where pan can be drilled, use screws through flange of lid

Surplus
24 rpm
\$3.50



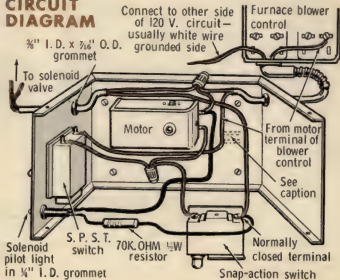
Used barbecue
spit motor
(\$6 new)



Surplus
14 rpm
\$1.99

TO TURN DRUM, use any small reduction geared motor with 14-24 rpm shaft speed; three examples are shown. Since motor shaft acts as front support bearing, position it carefully in female half of minibox, which is screwed to closure plate after wiring as at right. Dotted lines show where 120-volt humidistat would splice into circuit if desired. Pilot light is also optional

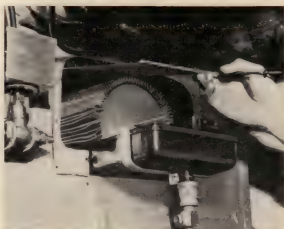
CIRCUIT DIAGRAM



INSTALLING UNIT IN FURNACE PLENUM



ACCESS OPENING must be enlarged to pass drum and vanes. Mark outline of closure plate around original opening, then trim with tin snips until large enough



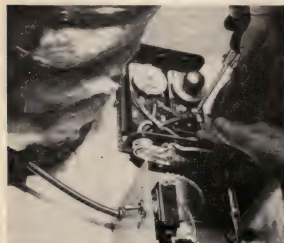
INSERT PAN about halfway, extending rear-support rod to engage its socket; insert drum axle and vane shafts into their rear support one at a time



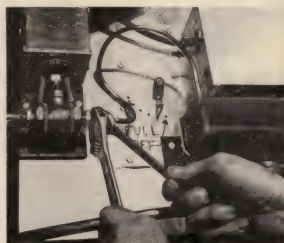
CLOSURE PLATE is tricky, since vane shafts must be fed through it and drum axle must be coupled to motor shaft. Once plate is seated, screw it tight



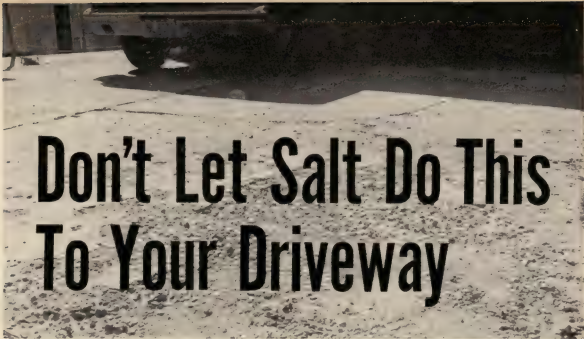
ADD VANE HANDLES by pulling forward on shaft while tightening setscrew against flat filed on shaft. Leave enough play to disengage positioning finger



BLOWER CONTROL unit on furnace is hooked into circuit so drum will revolve only when blower is on. Wire is connected to "motor" terminal of control



SOLENOID VALVE is connected to humidifier both electrically and with copper tubing that feeds water into pan when float arm trips snap-action switch



Don't Let Salt Do This To Your Driveway

TIME WAS when the only thing a town spread on its icy streets was sand. Now, however, calcium chloride and salt are widely used because they're active melting agents. They make for safer winter driving, but can spell trouble for your driveway; the salt slush clings to your car, comes home with you and drains onto your concrete. The scaling and pitting that results can ruin your garage floor or driveway in a single winter.

This can be prevented, however, by means of a simple treatment developed by Archer Daniels Midland, maker of Polymer-ik linseed oil. It's particularly recommended for new concrete, which is even more susceptible to salt corrosion than

concrete that's thoroughly cured. Now's the time to tackle this winterizing. Pick a warm, dry day (above 50°) and sweep the concrete clean. Mix one part boiled linseed oil with two parts mineral spirits. (This is an inflammable mixture, so don't heat it, and don't smoke while you work.)

Use a brush (as shown below), a mop or a garden sprayer. Let the first coat dry 15 minutes and remove any excess oil with a cloth or squeegee. Apply a second coat and let it dry for eight hours.

Two gallons of the mixture is plenty for both coats on a double-car garage slab. It's nearly colorless—and there's a bonus: It inhibits "dusting" and makes the surface easier to keep clean.



AFTER TUNEUP—

You just had a \$20 tuneup, yet the car runs worse than ever. You want to strangle somebody. Control that homicidal urge until you check the ignition system—it often masquerades as “tuneup troubles”

TOO MANY Saturday Mechanics regard the tuneup as a sort of automotive aspirin—a cure-all for a multitude of mechanical ills.

Sure, regular tuneups will prolong the life of any car's engine, but they should not be considered a substitute for particular repairs which are required from time to time. For a tuneup—like an aspirin—can serve to hide a major ailment by temporarily alleviating the “pain”—that is, by concealing the symptoms of more serious troubles.

While there isn't *any* automotive problem that can't be solved, the rub comes in *finding* the problem. Many troubles that exist before a tuneup, and persist afterward, are traceable to faulty ignition. So let's examine those ignition problems which could mislead you into spending \$10, \$20 or even \$50 for a tuneup that simply wouldn't “take.”

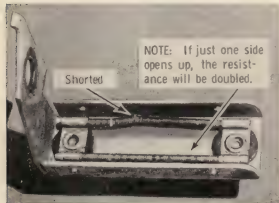
ITEM: Fred's 1964 Pontiac was experiencing a gradual loss of power. A complete tuneup plus strict timing to specifications proved fruitless. A new set of spark plugs

every 2,000 miles seemed to help for a time, but at 85 cents a plug it was getting sort of expensive. Fred was ready to toss in the sponge when I got into the act via *Auto Clinic* with a service tip from the Champion Spark Plug people (bless 'em).

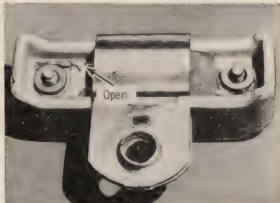
“With the introduction of the 12-volt battery as standard equipment,” noted Champion, “the ballast resistor (primary circuit resistance unit) came into existence. This gadget lets approximately full battery voltage flow through the ignition coil and hence through the ignition system to the plugs during cranking to help give those ‘one-rev’ starts.”

Fine. However, once the engine fires, the sustained high voltage would burn up the distributor breaker points if it weren't for the ballast resistor. The resistor takes the electrical load from the battery and cuts it down about 50 percent by means of a resistor wire or wires. Thus the voltage that hits the coil is about half of what the battery originally delivered.

The ballast resistor is located between the battery and the coil, usually on the



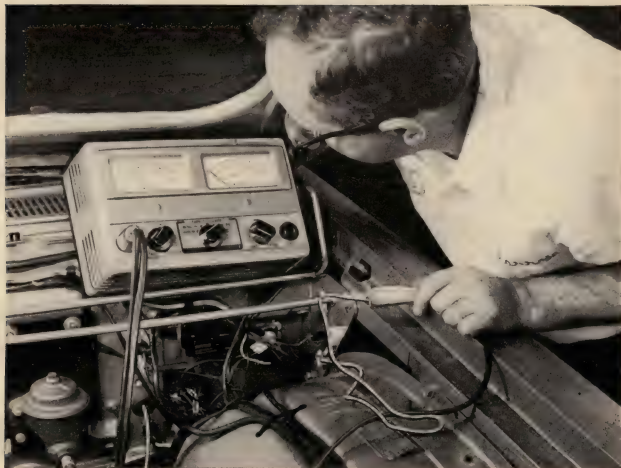
THIS BALLAST RESISTOR was put out of business when a resistance wire shorted against the case. The resistor above is a double-wire unit; other types utilize only a single wire of quite heavier gauge



ANOTHER FAILURE of ballast resistors is for a resistance wire simply to part (above). The open resistor completely cuts off electricity from the ignition system. The one cure: install a new ballast resistor

-WHAT?

By Morton J. Schultz



firewall. Having no moving parts to wear out, these are pretty dependable little items. But when one *does* go it can be tricky to troubleshoot.

A ballast resistor can fail in three ways:

(1) It can short out. If a resistor wire warps or bends and touches the side of the case, a direct short circuit of battery-

voltage-to-ground is produced. This can also send a scary cloud of smoke billowing out from under the hood.

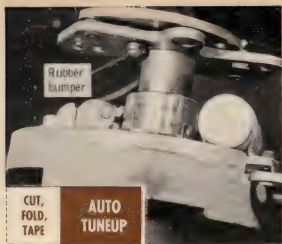
(2) It can open up. The resistance wire can part with results similar to an open switch. With the open resistor preventing current from reaching the coil, no electricity gets to the ignition system or the spark plugs, and the engine stays dead.

(3) It can change value. This is the most common failure. A change in resistance value leads to an increase in resistance so that voltage output to the spark plugs is proportionately reduced. The table on page 183 shows the relationship between increased resistance in the ballast resistor, voltage available to the coil, and the voltage which ends up at the spark plugs.

A change in resistance value takes place slowly to gradually cripple your engine's

Resistance	Volts to Resistor	Volts to Coil	Voltage Available to Spark Plugs
1.5 ohms (new)	14.6	11.1	32 KV
2.6 ohms	14.6	9.5	22 KV
3.0 ohms	14.6	9.1	20 KV
5.0 ohms	14.6	8.4	15 KV

TABLE SHOWN ABOVE relates resistance-in-ballast-resistor to volts-reaching-coil to volts-reaching-the-plugs



RUBBER BUMPER on distributor advance stop pin beneath breaker plates is designed to eliminate point rattle. Worn bumper can cause pin to drop off. Result: preignition and loss of power at high speeds

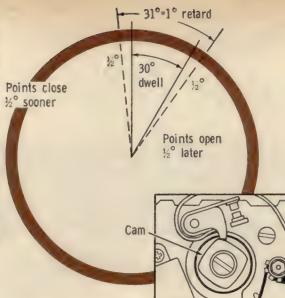
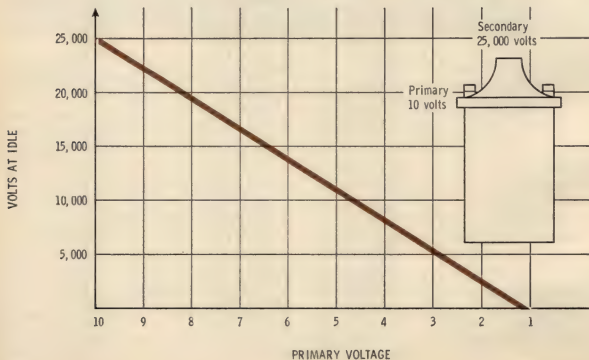


DIAGRAM ABOVE shows how a 1° increase in dwell angle causes points to close 1/2° sooner and open 1/2° later, leading to a 1° retardation of timing. A worn, poorly lubricated cam will accelerate this trouble

TO PROPERLY LUBRICATE the distributor cam, it is necessary to apply only one drop of distributor cam lubricant at one point on the cam. As the cam moves, the lubricant then distributes itself around it



GRAPH BELOW shows how 10 volts of primary current to ignition coil produce 25,000 volts in the ignition secondary. A bad connection can steal one primary volt and rob 2,500 volts from ignition secondary



power output. A tuneup won't help. Replacement of the bad resistor is the cure.

Replacing the spark plugs will mask the need for a new resistor for a time, since new plugs require less voltage to fire. But soon the car will again begin to misfire.

Connect up your trusty voltmeter, to take readings at both the input and output sides of the ballast resistor, as shown in the photo on page 183. It will show if the resistor is reducing battery voltage the required degree.

If a voltmeter is not available, it's a simple matter to replace the questionable resistor with a new one of the same type. They're not expensive and are easily installed. Then road test the car to check performance.

"Only a Volt?"

ITEM: Resistance problems were plaguing Joe's 1965 Plymouth, and his sad report went something like this:

"I turn the ignition switch and the car starts. I let go of the switch and the car stalls. I've had the fuel system inspected time and time again, but the trouble persists. What the h---'s the matter with it?"

Chrysler Corporation kindly reminded me that you can't get more out of a conductor than what's put into it. Too much resistance anywhere in the ignition system robs spark plugs of the voltage they need to fire across the electrode gap. Frayed conductors, loose connections and terminal corrosion can each or all steal a volt or two from the primary ignition circuit.

"Only a volt or two?" you ask, "That isn't much!"

Isn't it. Let's say that 10 volts of primary current to the ignition coil produce 25,000 volts in the ignition secondary at idle speed. It follows, then, that for every volt put into the coil primary you're getting 2,500 volts at the coil secondary. So a loose connection or bad conductor that causes a loss of just one volt of primary current can very easily rob you of 2,500 volts of secondary current!

In Joe's case we suggested he check his ignition connections for corrosion and tightness. Sure enough, he discovered that the terminal that clipped to the ballast resistor on the end of the wiring harness coming from the ignition switch was covered with corrosion. Once he cleaned it he again had a smooth-running car.

ITEM: Harley's 1961 Ford began to lose power. He gave it a tuneup, even checked the ballast resistor and had it timed to specifications, but the old girl stayed sluggish. I wrote him to recheck the timing; that that might very well turn up a clue to the trouble.

This is why: there's a degree-for-degree relationship between point dwell and ignition timing. If point dwell is changed one degree, for example, ignition timing will change one degree.

Now suppose you checked the timing at tuneup time, then experienced loss of power. Upon rechecking the timing you find it retarded several degrees. What this tells you is that the guy who did the tune-up may not have checked the distributor cam. Proper lubrication of this cam should be a required part of any tuneup.

Of course, retardation of ignition timing by several degrees after 15,000 or 20,000 miles is normal, even with a well-lubed cam. But a dry cam will speed up this process considerably. Its lubrication requires the application of a thin film of distributor cam lubricant on the cam whenever the points are serviced. Remember too to check the timing periodically; this is vital not only for good engine performance, but can also tip you off to a cam that's running dry.

Preignition at High Speeds

ITEM: "Preignition and loss of power at high speeds is my problem," writes Mike. "Changes in gas brands haven't helped, tuneup hasn't helped, and now we're all stumped because the distributor shows an over-advance of about 2½° on the bench tester.

Doggone if the Champion folks didn't come through again with a revealing, if somewhat cryptically phrased, word of enlightenment: "Lack of bumper can be a stumper."

Their tip referred to the use of a rubber bumper on the distributor advance stop pin beneath the breaker plates of some distributors. Those bumpers are designed to eliminate possible point rattle. Sometimes wear will cause a bumper to get sloppy and drop off the pin: then the breaker plate advances a few degrees more than it's supposed to.

One type of distributor, for example, has a maximum advance of 15.5° at 2000 rpm. With the bushing missing, the advance increases to 18.8°. Some distributor breaker plates have a brass fitting instead of a rubber bumper; these serve the same purpose, but here too the pivot pin can get sloppy and the results will be the same.

This article has discussed four of the most troublesome ignition conditions you can run up against.

One final word. Don't get the impression that we dismiss the periodic tuneup as unnecessary. It's vital! But to cover all bases we suggest that you include these other spot checks in your tuneups, as well.

★ ★ ★

Auto Clinic

Mort Schultz's remedies for mechanical headaches

Rabid Ford

What causes my '58 Ford's power steering system to lose 1 to 1½ in. of fluid? The pump and the relief valve have both been checked out and appear okay. What else could be the matter? —Hector Ballentine, St. Louis, Mo.

The system probably has a case of the foaming "rabies." With a good relief valve and a leakproof system, fluid can only be lost through the vent hole in the reservoir cover. This happens when the fluid starts foaming because of a buildup of internal pressure. Stop this foaming by fashioning a leather washer to fit over the metal one you'll find beneath the cap vent hole. M.S.

Reader Reveals Repair

Your fix for a sticky Corvair gas pedal (June *Auto Clinic*) was on the beam, but I'd like to offer another in case yours might not have worked for some guys. I too tried a stronger return spring and cleaned out the dirt and gunk from beneath the pedal, all without success. Then I took the unit apart and found that both the mounting bracket beneath the pedal and the round shaft that's supposed to turn in it were rust-bound. I cleaned both and then drilled a small hole in the bracket that allows me to apply a few drops of oil every so often without having to pull the thing apart. No problem since. —Bob Clark, Madison Heights, Mich.

Thanks, Bob. By the way, we'd like to hear from some more *Auto Clinic* readers. Write us *your* solution to an automotive problem and we'll make every effort to publish it in this column. M.S.

Some Meteors Play Tag

My 1963 Mercury Meteor keeps stalling. We've gone over it from stem to stern, but with no luck. I'm writing to let you know that some problems can't be solved although you always seem to indicate that they can. Guess you're

just an optimist.—Martin Linz, Harrisburg, Pa.

And I'm just as optimistic as ever, Martin. With this car, as with other '63 Merc models, it's been found that a cause of stalling—believe it or not—has been the *coolant instruction tag under the hood*. If this tag is in its original factory-placed position it can be sucked into the air cleaner opening. This cuts off the supply of air to the engine which, of course, causes the engine to cut out. M.S.

Coolant's Got Him Hot

The coolant leaks from an exhaust manifold stud of my 1963 Olds F-85. I haven't been able to stop it. Any suggestions?—John Klummer, Lexington, Ky.

Oldsmobile says this common problem can be stopped by removing the manifold and leaking stud and carefully cleaning off the threads. Then apply a *thin* coat of Permatex No. 1 to the threads and reinstall stud and manifold. Don't use too much sealer; the excess can build up on the manifold face and leave the manifold nuts loose when the sealer burns away. M.S.

Buick with a Bang

My 1959 Buick Electra 225 makes a clanking sound when I go over a bump—like two pieces of metal being banged together. I can also produce this noise by rocking the car from side to side. Should I have the rear pulled, or isn't it anything to worry about?—William Pallum, San Francisco, Calif.

It's tough to diagnose any noise "by mail." However, in this case I'd be inclined to say that this is probably nothing to be concerned about. These Buicks tend to develop a sort of clanking sound which is caused by the normal end play of the axles. It happens when the axles hit against the spacer blocks inside the differential carrier when the

Each month Auto Clinic answers your questions on car repair. For a personal reply, please enclose 25 cents in coin to cover mailing and handling. Address questions to Auto Clinic, Popular Mechanics, 575 Lexington Ave., New York, N.Y. 10022.

car goes over a bump. Some guys have set about eliminating this noise by reducing the space between the axles and spacer blocks. I don't advise this, though, because it puts excessive strain on the spider gears. M.S.

Volvo-Whoa!

Even when it's in gear, my 1958 Volvo starts to roll slowly down hill when it's parked on a steep grade. Some day I'm going to look awfully stupid chasing this car like a Keystone Cop. The clutch isn't slipping—my mechanic says it's in good shape.—Tim Josepchs, Montreal.

Hey, Tim, are you yanking the emergency when you park on those hills? And if so, what kind of shape is it in? Anyway, cars that have low compression ratios to begin with (such as the Volvo) do have a tendency to do this

sort of thing as they get older. Your clutch probably is in good condition. It's likely the weight of the vehicle is just too much for the decreased holding power being provided by the decrease in compression that comes with age. You can confirm this theory by making a compression test. Chances are you'll find it below manufacturer's specs. M.S.

Microbus Won't Back

My 1957 VW Microbus has the twitches. When I shift into reverse and engage the clutch it jumps out of gear. I can't even hold it in; the gears start to grind and there's a tremendous force against my hand. Do you have a cure for this balky bus?—Ed Duff, Bristol, Conn.

Installing a new idler gear in the transmission will very likely cure this ailment. M.S.

Auto Upkeep Tips

- **SOME '65 TEMPEST SIXES** have been balking because of carburetor load-up. Pontiac engineers suggest three possible causes of this trouble: (1) Improper setting of the choke thermostat rod to manifold; (2) improper distributor point gaps; (3) the thermostat spring in the choke housing, which connects to the exhaust manifold; could be attached in the wrong direction. Check out (1) and (2). If trouble persists, replace the thermostat spring and housing.
- **THIS SENSIBLE ADVICE** is from Chevy, but all car owners would do well to bear it in mind: Never use polish on bright interior trim areas such as are found around clusters, consoles and arm rests. Much of this trim is chrome-finished plastic and will become marred when subjected to silicones or abrasive compounds. Best way to clean this stuff is with a damp cloth, followed by a buffing with a soft rag.
- **WHEN THE '65 STUDEBAKER HAWK** with disc brakes fails to brake properly, check for worn or glazed brake pads, improperly adjusted rear wheel brake shoes, low vacuum supply to the Hydrovac, and improper operation of the Hydrovac. If the brakes still fail to come up to snuff, Studebaker suggests you install their Kit No. 1565515 to the Hydrovac. It'll increase Hydrovac output pressure about 100 pounds.

OFFBEAT TRICKS WITH YOUR *Radial-Arm Saw*

By R. J. DeCristoforo

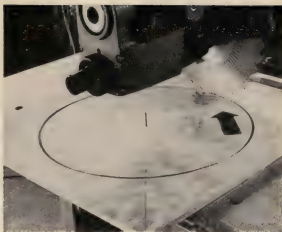
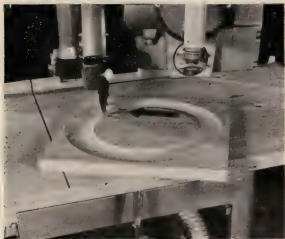
IF YOU'VE LOOKED upon the radial-arm saw as nothing more than a cut-off tool, you're in for a surprise. For, by fully utilizing its swiveling, tilting, swinging and sliding movements, you'll find yourself doing such a bagful of tricks with this versatile machine that its basic cutoff function will seem almost incidental.

Once you master a few settings, you can use the saw for jobs you'd otherwise have to do on a lathe, jigsaw, router—or by hand. In some cases, the way the tool performs suggests special decorative treatments you could achieve by no other means. The techniques demonstrated on these pages are only a starter.

CURVED GROOVES AND SLOTS can be formed with the power unit locked in the rip position and the saw arm swung right to left. Work is clamped securely to table and dado cut is achieved by repeat passes of $\frac{1}{8}$ -in. bite



BY SETTING BLADE in rip position and using a nail as a center pivot (right), you can rotate the workpiece against blade rotation and thus cut a perfect circle. Since the blade is always tangent to the arc, you are actually making a cove cut, but as this occurs in the waste only, the edge of the circular piece is cut square. Cut should be made with repeat passes, lowering the blade about $\frac{1}{16}$ in. each time as you cut completely through to the work surface beneath



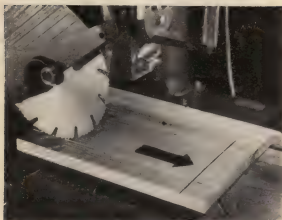
SIMILAR SETUP IS USED for cutting circular coves as for cutting circles. Main difference is that saw blade is adjusted so that it is actually cutting a true cove instead of tangent to the arc. The greater the offset of the blade in relation to the circle, the wider the cove cut. Since the blade does as much scraping as it does cutting, full depth of cut must be made by repeat passes, the final one with blade barely touching to produce the smoothest possible surface



SMALL CIRCLES can be cut in this unique manner simply because the power unit can be rotated 360° . Clamp the work securely to the table and tilt the dado about 10° . Lower the dado slowly until it makes a small bite and then rotate the power unit a full circle. Repeat the step, taking a $\frac{1}{16}$ -in. bite each time until the cut is complete. If you plan to cut completely through, back up the work with a scrap piece to avoid cutting into the saw's wooden table

SAUCER CUTS (below) are accomplished by swinging blade back and forth through power units tilt range in the crosscut position. Full depth of saucer shape is achieved by making repeat passes, and you can cut faster and deeper if you do the job with a dado as shown. Be sure the workpiece is clamped securely and keep the hands well away from the cutting area. Saw's tilt stop must be disengaged, of course, to permit unrestricted swing of power unit





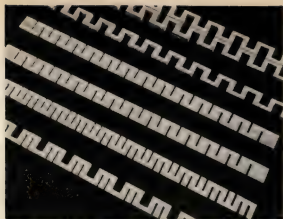
PANEL RAISING can be done in a more convenient manner on a radial saw than on a conventional table saw since the operation is done with the workpiece flat on the table. With the power unit set in the rip position and at the desired distance from the fence, $\frac{1}{8}$ -in.-deep shoulder cuts are made in the surface of the panel first, running saw cuts around the four sides. Then to "raise" the panel, the power unit is set for horizontal cutting, the saw tilted up a few degrees and the panel is fed past the slanting blade as it is guided along the fence. The blade height must be set so the cut ends at the very bottom of the kerfs. Since the blade must clear the saw's fence, it is necessary to support the work on an auxiliary panel of the proper thickness, to raise it above the fence. The panel is temporarily fastened to the saw's table



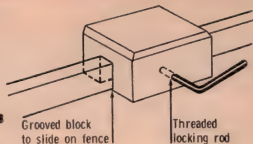
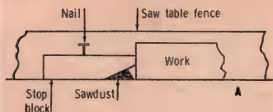
LIMITLESS VARIETY of fancy decorative cuts is possible through the saw's tilting action. The faceted surface you see here is accomplished with a dado by setting the power unit in the rip position and then tilting it 45° . Each pass produces a V-groove, so equally spaced cuts, with and across the grain, create a pleasing decorative surface. Smooth job results when the crossgrain Vs are made first; this holds true in making any cuts both with and across the grain



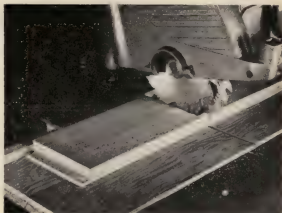
IN ANOTHER EXAMPLE of decorative "carving," the power unit is set in the crosscut position and tilted 45° . To form one side of the gothic V-cuts you pull the dado. To cut the other, you turn the work end for end and push the dado across the work. A C-clamp attached to the saw's arm serves as a stop to limit travel of power unit and establish length of grooves. Spacing of each pair of cuts is assured by use of a stop block which is repositioned as work is shifted



EXAMPLES OF "DENTAL" TYPE MOLDING which are formed by kerfing as shown above, left. Some are made with a saw blade, others with a dado blade, still others by combining both. Cuts are made across grain of thick stock, then sliced lengthwise into thin strips. Top molding in photo results in joining two pieces edgewise. An endless variety of patterns is possible by varying spacing of cuts

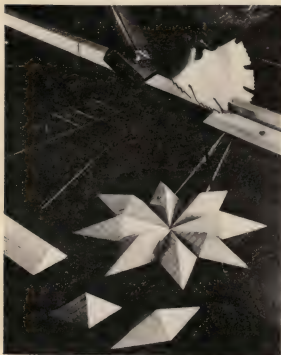
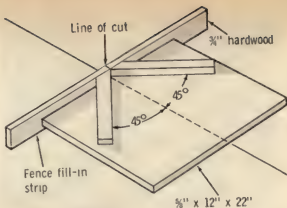
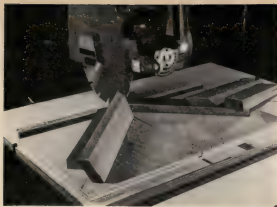


WHEN A STOP BLOCK IS TACKED TO THE TABLE, sawdust can't build up and interfere with the workpiece if you bevel the butting end as in detail (A). Detail (B) shows how you can make a handy adjustable stop block that rides and clamps to the fence



TO FORM SCALLOPS with a dado, set the power unit in a horizontal cutting position and lower it so the dado just clears the fence. Feed the work slowly since the dado will tend to kick the work out of position. A C-clamp attached to the saw's fence will provide a stop against which you can brace the workpiece as you feed it. This basic cut can lead to many pleasing designs merely by changing the spacing between the units. Saw guard has been purposely removed to show operation more clearly in this photograph, but for actual cutting it should always be in place as a dado in this position can be quite dangerous

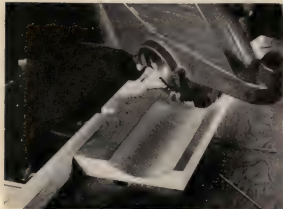
YOU CAN PERFORM DUAL OPERATIONS that save considerable time by combining different blades on the saw's arbor. Here a 6-in. dado and a 7-in. saw blade ganged together not only severs the workpiece but forms an end rabbet both at one pass. Likewise, two saw blades of equal diameter spaced apart with washers, will cut kerfing time in half. Surface kerfing with twin blades spaced apart will also add a decorative border to wall plaques, drawer fronts, etc. When end-rabbetting with ganged blades in the manner pictured above, you can protect the saw's table with a scrap of 1/4-in. plywood.



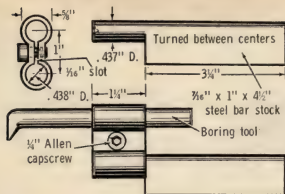
BEST WAY TO CUT MITERS is to use a mitering jig and forget the 45° setting of the power unit. The jig (detailed above) fits the slot of the saw's regular fence and is aligned with the blade so the line of cut splits it down the middle. It's the only practical way, too, to cut compound miters. Edges of stock are pre-beveled and then workpiece is stood on edge and held firmly against fences of guide as work is cut

EIGHT-POINTED DIAMOND STAR (left) is an example of the different decorative rosettes which can be assembled of pieces cut from triangular strips. Here the saw's arm is swung to a 45° setting and the power unit is tilted to match the bevel of the strips. Segments are "chopped" off in quantity by making the first cut with the stock placed to the left of the blade, then shifting it to the right-hand side to make the second cut. In each case, the blade must be in exact line with the topmost point of the first cut

DIFFERING FROM TABLE-SAW technique, cove cutting here is done from the top side of the workpiece and fed to tool along saw's fence. Either a blade or dado may be used. For the widest cove the saw is set for simple crosscutting and the blade tilted 10° to the left. Then it's located over the center of the work, adjusted to take a 1/8-in. cut and locked. The workpiece is fed repeatedly from right to left as if being ripped. Width of cove is varied by changing angle of blade, the greater the angle, the narrower the cove. Edge coves are made by varying blade angle and tilt



Adjustable Boring-Tool Holder

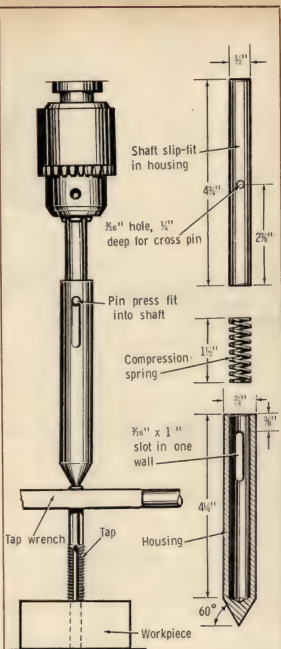
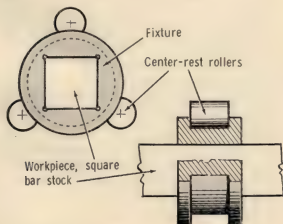


This holder with its swinging head permits universal adjustment of the boring bar without shifting it in the toolpost. A locking screw clamps the head to both bar and tool. Turn down one end of a piece of $\frac{7}{16} \times 1\frac{1}{2}$ -in. c.r. steel to .437-in. dia., $1\frac{1}{4}$ in. long and chamfer the end. The head is $\frac{5}{8}$ -in.-wide tool steel through which two .438-in.-dia. holes are drilled, then bridged by a hacksawed slot. The holes for the locking screw are drilled for a $\frac{1}{4}$ -20 tap. Use a hex-head locking screw (cap screw) which can be tightened with an Allen wrench.

Turning Square Work

This fixture is designed to facilitate turning a number of long, square pieces of stock having the same sectional dimensions, and which cannot be supported by a steady-rest. A square opening just large enough to fit over the stock is cut dead center in a round turning as shown below. This piece is then retained in a conventional steady-rest clamped to the lathe bed. Note the two shoulders in which the rollers of the steady-rest ride.

—D. F. Kimberling

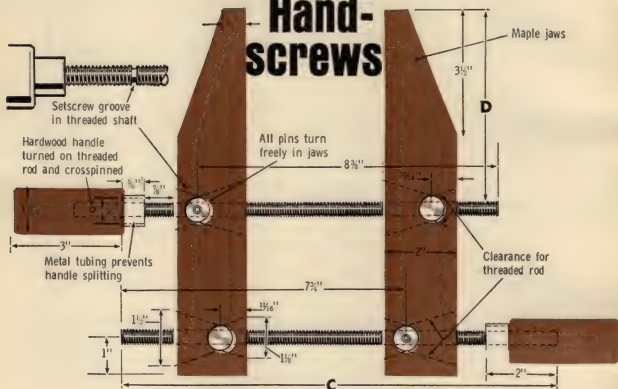


Spring-Loaded Tapping Center

You'll have fewer broken taps with this gadget chucked in either your lathe or drill press. Chuck the tap in a tap wrench in the usual way and snug it against the hole to be tapped. Bring the tapping center to bear and center on the tap until the crosspin hits the bottom of the slot. Lock the drill-press quill, and then turn the tap by its wrench until about halfway into the hole. Then back off the center and finish tapping.

—Louis Owen

Make Your Own Hand-screws



TOO MANY home shops make do with a few metal C-clamps because quality handscrews are more costly. They're worth it, of course, since they're more versatile than any standard clamp, and can do jobs that would require elaborate jigs if other types of clamps were used. The great adjustability of handscrews have kept them the first choice of fine cabinet-makers for generations.

Still, budgets are budgets, and if yours is limited, you can *make* yourself a selection of handscrews in various sizes. We give dimensions for 10- and 14-in. clamps, and with a little figuring you can adapt the plans to 6- and 8-in. sizes.

Maple or birch hardwood is best for the jaws. After cutting these to size and shape, drill the crosspin holes through the faces and the rod holes through the edges. The former should provide a slip fit for the

smooth pins; the latter holes must then be tapered into butterfly slots (with a rat-tail file) as shown in dotted lines, above).

After cutting the setscrew grooves in the rods, it's a good idea to heat-treat these areas so the setscrew won't wear the groove for too loose a fit. Turn the handles onto the short end of each rod and then secure them with a pin driven into a hole you've drilled through both handle and rod. If you make your own handles, turn the familiar shoulder on the drilled end, to take a split-proofing ferrule (cut from tubing) as indicated.

Set the pins into the jaws, slide the rods through the untapped pins and turn them into the tapped ones; then line up the grooves with the setscrews and turn the latter in. Rub oil into the jaws so they won't stick to work being glued.

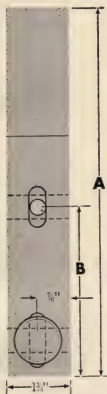
—Emil P. Kushner Sr.

Now you can own all the quality clamps you need in your shop— you just make them yourself!

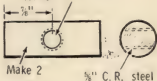
KEYED DIMENSIONS

	10" CLAMP	14" CLAMP
A	10"	14"
B	4 $\frac{5}{8}$ "	5 $\frac{1}{8}$ "
C	12"	16 $\frac{1}{4}$ "
D	5 $\frac{1}{4}$ "	7 $\frac{3}{4}$ "
JAWS OPEN	5"	10"

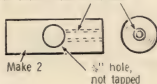
Note: Dimensions shown on sketch from setscrew groove to end of rods apply only to 10" clamp. Add 5" to each for the 14" size.



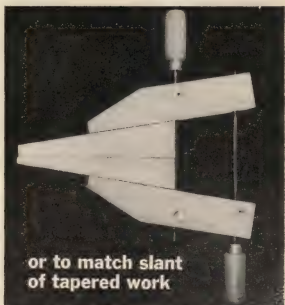
Drilled and tapped for $\frac{3}{8}$ " rod



Drilled and tapped lengthwise for socket-head setscrew



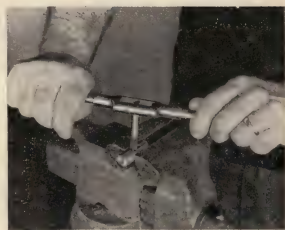
Can be adjusted to reach in...



or to match slant of tapered work



TRUE HOLES are assured if you bore the jaws on a drillpress to take the 1 $\frac{3}{4}$ -in.-long inserts cut from cold-rolled steel. Bore on into scrap underneath



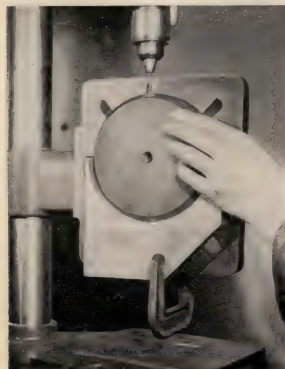
TWO PINS in each pair of jaws are tapped for the $\frac{3}{8}$ -in. threaded rod, as shown. The two others are only drilled for the rod, but tapped for setscrews

Lazy-Susan Tie Rack



AFTER SAWING, a 60° chamfer is formed on bottom edge of disc by rotating it against a belt sander

ACCURATE DRILLING of holes for L-hooks is done by using the piece from which disc was sawed as a jig

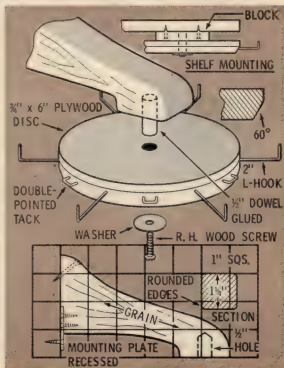


SMALL ENOUGH to fit into a corner, this compact rack spins for easy selection of both conventional and pre-knotted ties. The former are merely draped over L-hooks, while the collar clips of the pre-knotted kind hook over staples driven only part way in.

A scrap of $\frac{3}{4}$ -in. hardwood plywood and a piece of $1\frac{1}{4}$ -in. solid stock are needed for a wall-mounted rack. After cutting a 6-in. disc from the plywood, bore a $\frac{1}{2}$ -in. hole in the center and chamfer the bottom edge as shown at left. It's best to finish the disc before mounting the hardware, using either shellac or oil stain.

With a compass or dividers, mark off 12 spaces around the edge of the disc, then drill pilot holes at every other location for 2-in. L-hooks. Before screwing them in, drive in the staples so they project $\frac{3}{16}$ in.

For mounting under a closet shelf, a spacer block is needed. For wall mounting, cut out a bracket after first boring the hole for the dowel axle at precisely 90° to what will be the bottom edge. A shallow rabbet is cut in the vertical edge to accept a small brass mounting plate.—*Hank Hilton*

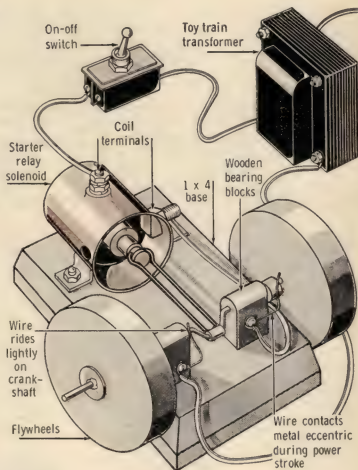


Solenoid Toy Engine Will Fascinate the PM Boy

IT WON'T DEVELOP more than 0.01 fp (flea power) but a boy will have great fun building this fascinating solenoid engine and still more fun tuning it to run like a real powerhouse.

The solenoid is a junked relay from a 6 or 12-V. Ford auto-starter circuit. Take off the front cover and remove the switch gear that's attached to the plunger. Then drill a $\frac{1}{8}$ -in. hole through the plunger shaft to serve as a wrist-pin bearing.

The connecting rod and crankshaft are formed from a wire coathanger. The crankshaft is bent so it has about $\frac{1}{4}$ -in. throw. The bearing for the connecting rod is a $\frac{1}{4}$ -in. length of steel tubing having an inside diameter that will just slip over the crankshaft. The tubing is slipped in place before the crank is bent and is finally soldered to the end of the connecting rod. The crankshaft bearings are wooden blocks, drilled for a loose fit, and fastened to a wooden base. The 3-in. wooden flywheels are



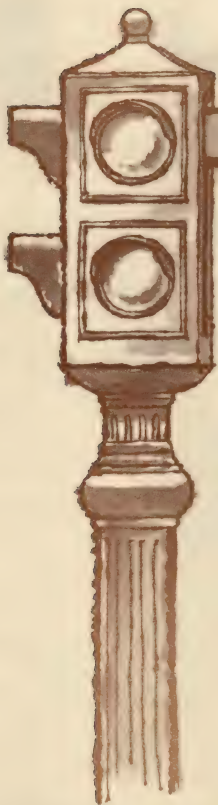
(Please turn to page 209)

Next Month in Shop and Crafts

GET READY FOR CHRISTMAS. If you like to make gifts for the family and to decorate your home for the holidays, you'll want to catch the big 29-page Christmas section in the December PM. You'll find a choice of three novel dollhouses, action toys, table decorations, plus prize-winning animated yard displays to put your home in a gay holiday spirit

STAIR BUILDING SIMPLIFIED. Like building a lift bridge so it will meet in the center, how do you layout stairs so you'll wind up with the proper rise and headroom? It's perplexing sometimes for even the experienced carpenter, but it's all figured out for the home remodeler in a handy chart included in a short-course in stair building in December PM

BANDSAW SPEED REDUCER. Gearing down your bandsaw so it can cut metal as well as wood, makes it twice as useful. An auxiliary switch-over unit having its own motor, reduces the normal wood-cutting speed so you can cut $\frac{1}{8}$ -in. steel and even thicker metal. You convert by simply engaging a drive pin in the pulley shaft or a worm gear attachment driven by the second motor. Learn how to build and install the unit on your saw in the December issue



don't let
electrical
problems

STOP

your car

By Brice Ward



THIS CAR'S REGULATOR IS GOOD. Meter is connected to B terminal and to lead previously removed from this terminal. Normal reading is 30 amps.

Build this \$14.95 A-B-G-R kit to find and fix auto electrical troubles quickly. Check alternator, battery, generator, regulator.

HAVE YOU EVER WISHED you could make a quick check of the condition of your battery? Car battery, that is . . . because maybe it doesn't start the engine in the morning the way it should? Perhaps the starter runs a little slow or the spark just isn't up to par? Does the regulator leave something to be desired?

The little instrument described here will do about anything in the electrical circuit of the old bus except, perhaps, check the secondary circuit of the ignition system. Because of its extreme versatility, we call it the A-B-G-R tester, which stands for alternator, battery, generator and regulator tester. It will also check for grounds and open circuits by using the automobile electrical system for an assist.

Let's look at its functions first. It can measure voltage on either an 8 or 16-v. scale (corresponding to 6 and 12-v. systems). It can check regulator operation. It can be used to measure current to 60 amps., which is ample for almost any ordinary make of car, even when it may hap-

pen to be equipped with an alternator.

As a bonus, it features a separate 3-v. scale for checking battery cell voltages and for troubleshooting by the voltage drop method. The ammeter can also be used to check the current drawn by lights, the ignition system and other accessories.

The entire unit can be slipped in the glove compartment of most cars and will save many hours of looking for simple troubles as well as many dollars in repair bills if properly used.

You can build the A-B-G-R from scratch or buy a complete kit of parts from Techni-Kits for \$14.95. It is a complementary unit to the cam-dwell meter (page 196, Feb. '64 PM), another Techni-Kit available for the same price. Full details are given in the parts list.

To build your A-B-G-R, make and drill the panel first. The kit panel is supplied punched and drilled, but if you are making your own, a simple $\frac{3}{8}$ -inch round hole is easiest to make for the slide switches. A $1\frac{1}{4}$ -in. round hole takes the



QUICK-CHECK BATTERY CONDITION by measuring battery voltage. Connect probes across battery posts. Good batteries read higher than 6 or 12-v. ratings

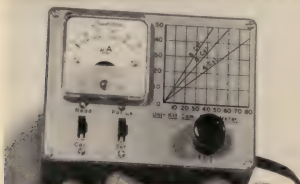


GOOD GENERATOR puts out about 7 v. if in a 6-v. electrical system, or 14 v. if in a 12-v. system. Take A-B-G-R reading right off generator terminals



CONVENIENT METER PROBES are actually a pair of ordinary screwdrivers. Clip A-B-G-R test leads to screwdrivers and you're in business. Excellent to check battery and generator

CAM-DWELL METER is companion to the A-B-G-R tester. Use A-B-G-R to check the car's electrical system first, then cam-dwell meter to tune up the engine for full-power operation



meter and the banana jacks require $\frac{1}{4}$ -in. holes.

Drill two small holes— $\frac{1}{4}$ -in. will do—for the volts and amps. leads through the side of the case. Follow the pictorial diagram for all wiring. Since the switch tab holes are rather small, you may have trouble connecting the lamp cord to them. The remedy is to cut the insulation back about $\frac{1}{8}$ -in. Tightly twist the small bit of wire extending beyond the insulation and force it through the hole. All of the wire will not go through and some strands will fan out around the switch tabs or lugs. Carefully solder the connection allowing the solder to fill neatly around the fanned-out portions. The result will be a neat, solid connection.

The ammeter is a special design that keeps the length of wire through which the high current must flow to a minimum. It allows the use of low-current-capacity switches.

The current flows through the black test lead to the shunt and the proportional current goes onto the meter by way of the amps-volts switch.

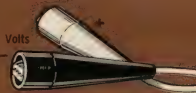
In theory, 60 amps flowing through the shunt will cause a voltage drop of 40 millivolts and full-scale meter deflection. Although the accuracy does not approach that of a 1 percent precision system, it is

PARTS LIST

- R1—58,000 ohms, $\frac{1}{2}$ -watt, 1% resistor
- R2—3,900 ohms, $\frac{1}{2}$ -watt, 1% resistor
- R3—159,000 ohms, $\frac{1}{2}$ -watt, 1% resistor
- S1—d.p.d.t. slide switch
- S2—s.p.d.t. slide switch
- J1, J2—banana jacks (red, black)
- Meter—1-milliamper movement
- Alligator clips (4)
- Alligator clip sleeves (3 red, 2 black)
- $\frac{1}{2}$ in. No. 18 tinned bus wire
- Bakelite case to suit (3x4x3 in.)

All parts for A-B-G-R tester can be ordered from most mail-order electronic houses. For list of firms, address Electronics Editor, Popular Mechanics, 575 Lexington Ave., New York, N.Y. 10022.

Complete A-B-G-R kit can be ordered from Techni-Kits, 350 Broadway, New York, N.Y. 10013. Price of \$14.95 includes case, pre-punched and printed panel, all electronic parts.



more than adequate for the measurements required.

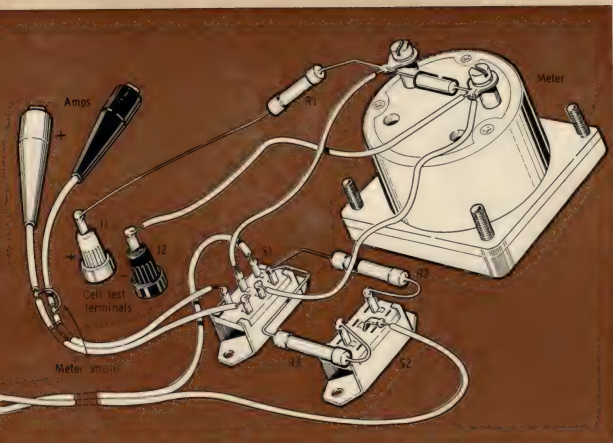
To make the shunt, slip a red boot over the ammeter cable. Cut the positive lead of this cable $1\frac{1}{2}$ in. shorter than the other. Strip both leads and take the piece of No. 18 bus wire (which should be a little longer than the $1\frac{1}{2}$ in. required) and lay it next to the longer lead of the lamp cord. Bend the stripped end of the lamp cord 90° and wrap it around the bus wire. Then solder securely. Now do the same thing at the other end. Be sure that the distance is precisely $1\frac{1}{2}$ in. Next add the clip connectors.

If a very small amount of solder flows onto the critical length, there is no problem, but a blob of solder or an amount that increases the diameter of the bus wire considerably or covers $\frac{1}{8}$ -in. or more of the wire shunt will cause some inaccuracy.

There are many uses to which this instrument can be put. Here are the important ones:

The Cranking Circuit. Connect the voltmeter section of the tester between ground and the B terminal of the regulator. The indicator should be in the yellow area to show that the battery is good.

Now disconnect and ground the secondary or tower terminal of the coil to insure



that the engine does not start and crank the engine while observing the meter. The reading should not drop below the red zone. If it does, one of three things may be wrong.

- The battery may be low.
- The battery connections may be bad.
- The starter may be drawing excess current.

To check the first, measure the voltage from one lead terminal to the other while cranking the engine. If the reading is the same as the one obtained at the B terminal of the regulator, the battery is bad. If the reading is higher, shift to the 3-v. cell test portion of the meter. Measure the voltage from the ground post of the battery to ground while cranking the engine. If a voltage appears here, clean the connection to reduce the resistance.

In a similar manner, check the voltage from the "hot" battery terminal to the cable connector. Clean the post and connector if the voltage is high here.

If the voltage is still low at the B terminal of the regulator, the starter is drawing too much current.

If the cranking circuit is good, disconnect the regulator B terminal and connect the ammeter clip leads. One lead is connected to the B terminal of the regulator, the other to the lead just removed.

Now reconnect the coil high tension lead and start the engine. If the meter deflects in the wrong direction, stop the engine and reverse the leads. No damage will be done to the meter when checking polarity in this way as long as the engine is not raced. Connect the red voltmeter lead to the B terminal of the regulator (negative ground systems) and the black lead to a good ground.

With the engine running and warmed up, (about 15 minutes) put the volts-amps. switch in the volts position and accelerate the engine to 2000 rpm. The meter should read about midway in the green section.

Switch to amps. and again accelerate the engine to 2000 rpm. The ammeter should rise to the current setting of the regulator (30 amps. in most normal service systems), then stop. If it goes beyond the manufacturer's specifications, the regulator is bad and should be replaced. Also, if the voltage goes above the green band by any great amount, or does not come up to the green band, the regulator should be replaced.

There are dozens of other tests that can be made with this instrument. Almost any test that can be performed with a commercial voltmeter-ammeter can be performed equally well with this instrument. ★ ★ ★

new in electronics



Talking pictures are a cinch with 8-mm Camra-Corder, using a high-quality zoom camera and a direct-coupled tape recorder for perfect sound-picture sync; \$330 from International Camera Corporation, New York

Cordless tape recorder the V-M Charger, runs 4 hours on nickel-cadmium pack, recharges on a.c. Unit has a 2-speed capstan drive, 6-transistor circuit and good sound



Pickup on tangent eliminates tracking error to reduce distortion, maintain stereo balance and give near-perfect reproduction. Tangmatic costs \$175; from John Bullock, Northridge, Calif.



Turn-around stereo-TV combination is a new twist that combines a stereo console system with a 19-in. television receiver. For viewing, one of the stereo speaker cabinets swivels around to reveal the TV. For music, the TV is swiveled out of sight. Marquette Corp. is the manufacturer of the turn-around unit





Introducing the tuned car. 1966 Buick.

What makes a car a car is styling, performance, ride and handling. Only when they're all tuned together is the car a Buick. Like this '66 Riviera Gran Sport.

Every last thing that goes into a Buick—suspension, body mounts, shock absorbers—not only has to work, it has to work with everything else. That's tuning.

Tuning is what we do more of (and care more about) than anybody we know of. And then we go out and test it in more places, too. On roads like the ones you'll be driving on. Why we do it will be obvious when you take your first ride. The tuned car rides and handles as handsomely as it looks. (Tuning may be hard to explain. But it's easy to notice.)

What the tuned car will do for you. And your family. For a start, the new Riviera

will comfort you. You'll see that when you slip into the Riviera's new bench seats. Space for six. If you like buckets, they're available, with a reclining arrangement for the right-front passenger. And we have another comforting option available: a new notch-back seat that converts from bench to semi-bucket.

Choosing the tuned car. Visit your Buick dealer. Every Buick you see is the tuned car. Riviera, the new international classic. Riviera Gran Sport. *Every '66 Buick.*

And with a choice like that, how in the world can you go wrong?

Wouldn't you really rather have a Buick?

Blaze a Bronco trail to



Roadster is great for the great outdoors! Convertible vinyl top and doors available.

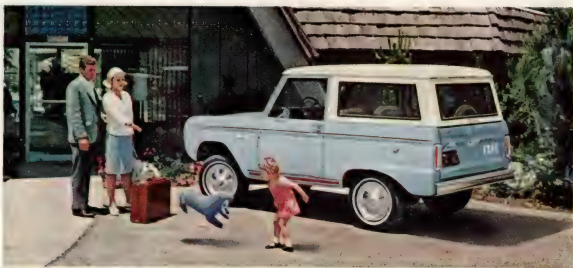
Bronco, the new 4-wheel

Unexpected traction, unexpected action, exciting things happen to driving when all four wheels provide the drive! Whether you collect big-game trophies or just the kids at school, you'll get a new lift from going when Bronco supplies the go!

You'll have a lot more fun in '66—if Bronco has a part in it! Bronco is the new kind of sports car with *4-wheel drive*.

Your Bronco will take you up hills too steep for roads. Over beach sand. Through unplowed snow (plow it, too, if you wish). Bronco will take you into the woods for hunting. And right to the banks of lakes and streams for swimming and fishing.

where the fun is!



Wagon takes the whole family... anywhere!



Sports utility does all kinds of chores... in all kinds of places.

drive from Ford!

Smooth six-cylinder power gives you the muscle you need for rough terrain... and the speed for expressway cruising.

Husky radius rods permit the use of soft-riding coil springs up front. So Bronco is a comfortable car for everyday family needs—shopping, running errands, driving to school or work.

Let Ford's frisky Bronco bring a new kind of living into your life!

Multiply Bronco's usefulness with these extras!

SNOW PLOW	WINCH	LIMITED-SLIP AXLE
SKID PLATES	TOW HOOKS	POWER TAKE-OFF
REAR SEAT	BUCKET SEATS	FREE-WHEELING HUBS
RADIO	OVERLOAD SPRINGS	TRAILER HITCH

Ford Bronco/66

GIFT GUN



Some stocking stuffer! Say "Merry Christmas," with a Daisy CO₂200

All the heft and feel of a more-powerful handgun... yet plinks all day for pennies! Fires inexpensive .177 caliber B-Bs semi-automatically at 400 feet per second. Constant full power from standard or giant Jett® CO₂ cylinders (no "O" ring to leak)... more than 150 shots from the large size. Adjustable sights. Ideal for indoor target ranges, camping out, fishing trips. How about it, Santa? About \$18.50.

Daisy®
CO₂ GUN DIVISION

For more information, see your local dealer or write DAISY MANUFACTURING COMPANY, CO₂ Division, Box 115-RI, Rogers, Ark. 72756.

How Many Beans in the Jar?

(Continued from page 97)

contest jar. If we can measure the dimensions of the contest jar, we can use these measurements to find the volume. For instance, if the jar is a sphere, the volume V is given by the formula $\pi D^3/6$ where D is the diameter of the sphere and $\pi = 3.1416$.

Even if the jar is of unusual shape, it still is generally what is known as a surface of revolution. That is, the surface swept out by a curve which is revolved about a fixed line (called the axis of revolution). For a football (ellipsoid of revolution) we have $V = \pi LT^2/6$, where L is the length and T is the greatest thickness. The volume of more complicated shapes can often be found with the help of calculus.

For really irregular jars and for jars that contest rules forbid you to handle, more complicated methods are needed. One can estimate the volume by taking photographs from a number of angles, or by using surveying equipment. Then the various measurements can be interpreted by statistics, another branch of mathematics, which will give a volume estimate and an idea of the errors involved.

Don't Forget Thickness

The volume estimates we have made are of outer volume. We want the inner volume, so we must be careful to correct our figures for the thickness of the container. Once we have a volume estimate, we can estimate the number of beans by using our own beans and containers.

Suppose we cannot obtain a supply of beans (peas, ball bearings or other objects) like those in the contest jar. Then, estimating is more difficult. One way is to again count how many beans are touching the inside of a "window" that you have marked off with adhesive tape on the outside of the jar. From this we get the average center to center spacing of the beans. This tells us how much room an average bean occupies. From this we can determine how many will fit in the jar's volume.

Finally, there is the psychological angle to consider. People tend to use round numbers in their contest guesses, as well as in daily life. For example, every census shows that there are more people who claim to be 35 than either 34 or 36! So if you think the number of beans is between, say, 8000 and 9000, don't guess 8000, 8100 or 8200. A round number has no more chance than any other of being correct.

But now you're on your own. Go out and find a rousing contest in which to test your skills. And if you lose, console yourself with the thought that all those beans you bought are edible. ★ ★ ★



Famous Homelite XL is so light you can balance it on one hand!



With a Homelite XL you can easily cut flush with the ground, remove dead, diseased or unwanted trees, and eliminate stumps that spoil the beauty of your yard and property.



Homelite XLs give you the power and ruggedness the professionals use for production cutting. The XL fells trees up to 4' in diameter, cuts 12" logs in 10 seconds!



Homelite XLs zip through 4" limbs in 2 seconds. Pruning, trimming and limbing shade or fruit trees is easy with Homelite XLs because they are so light, so fast, so easy to handle.

Have fun . . . save time, money and muscle with extra-light **HOMELITE** XL Chain Saws

If you have a home with trees, a campsite, a hunting cabin or cottage . . . then Homelite XLs are the saws for you!

Cut firewood, clear land, prune trees, cut brush with a Homelite XL — it's fast, extra light, starts quickly in any weather, handles easily. Choice of 6 XLs — get 'em as light as 12 lbs. 12 oz. less bar and chain.

Find your dealer in the Yellow Pages . . . get a free demonstration . . . and take a Homelite XL home! . . . the world's fastest-selling chain saws.

HOMELITE **Aetron**
DIVISION

10211 RIVERDALE AVE., PORT CHESTER, N.Y.



Famous Homelite XLs are the fastest-selling chain saws in the world.



Customize a low-cost Chevy-Van for your job!

Pictured above are just a few of the more than 80 special installations that can now be ordered through your Chevrolet dealer. Now you can equip a money-saving Chevy-Van for your kind of work!



Order cabinets or bins, shelves or racks . . . special windows, floors or partitions, a refrigeration system or extra ventilation or more seating comfort. And much, much more. You name it! Get just what you need for your delivery work—and take advantage of these Chevy-Van virtues: low initial cost and upkeep, big 211-cu.-ft. load space, flat floor, big doors, to name just a few. See your Chevrolet dealer. . . . Chevrolet Division of General Motors, Detroit, Michigan.

Pattern Your Shotgun

(Continued from page 175)

be done by an experienced gunsmith, unless, of course, you have had experience in this exacting work. But many of the variables can be corrected simply by altering handling practices.

Many trapshooters, also skeet shooters and hunters, like to "float" the bird, that is see it over the gun barrel or barrels, and to determine even more precisely where the gun throws its charge they often pattern from a rest. A sturdy card table will do for this testing. You'll also need a small box and padding to serve as a rest for the gun barrel or barrels. With this setup it's the usual practice to let off each shot just as the sight touches the lower edge of the bull. Here a steady hold is important and at first you may have a little trouble with trigger pull, which usually is somewhat heavier on a shotgun than on a rifle. Also, one may have to become accustomed to the relatively heavy recoil of a shotgun, especially in larger gauges and with magnum loadings. If you flinch, the shots will go wild.

Center Line of Sight over Rib

When properly carried out, this test will show just where the gun places its charge relative to the aiming point. Also, it offers opportunity to test placement of charges from the right and left barrels of side-by-side doubles and over-under guns. Your line of sight in this test—as in those described previously—should be about $\frac{1}{4}$ to $\frac{3}{8}$ in. above the breech and one should be sure the line of sight is centered over the rib before firing.

If desired, patterning tests can be carried farther to determine other governing factors and a "best" load for your particular gun. In patterning for a best loading you may discover a special compatibility of your gun for a certain factory or hand loading in light, medium or heavy chargings of powder and shot. One scattergun may consistently turn in its best patterns with a magnum loading. Another of the same gauge and boring may perform best with a light target (skeet or trap load) or field loading. In this testing, as well as those described previously, you may have to fire a dozen or more shots to reach a more or less definite conclusion.

The perfect pattern is a consistent uniformity of shot distribution inside a 30-in. circle at ranges suitable to the boring—40 yds. for full choke (12, 16 and 20 gauges), 30-35 yds. for modified and improved modified borings and between 20 and 30 yds. for the skeet and improved cylinder and full cylinder borings. Shot dis-

tribution should show a reasonably consistent uniformity at these ranges. There should be no large, irregular holes in the pattern print and no undue bunching or cartwheels, and only a small number of flyers, the latter deformed pellets which land wide of the main concentration. If you fire the newer shot shells with combined plastic shot cups and wad columns, you may see few, if any, flyers. The 28-gauge and .410-bore guns usually give the best pattern prints at the shorter ranges, 25 to 30 yds. average, and these generally perform best with the smaller shot sizes, such as No. $7\frac{1}{2}$, 8 and 9.

Determining Shot Percentages

It's easy to arrive at the shot percentages. Make a simple compass of 15 in. radius like that detailed, lay the pattern sheet on a flat surface, determine the greatest concentration of pellet holes and strike a circle around this area. Then, using a felt marker, mark the shot holes in the paper within the 30-in. circle, counting as you go. Some testers count the shot holes on the line as well. Then, for example, if there are, say, 300 holes in the circle and the average number of shot pellets per shell is 400, then 300 times 100 divided by 400 equals 75, or a 75 percent pattern. These are only convenience figures, of course, but they show how percentages can be arrived at. The percentages will vary somewhat from shot to shot and if you desire a further average, then it will be necessary to fire a minimum of 10 shots or so to determine this figure. ★★★

Solenoid Toy Engine

(Continued from page 197)

a press fit over the ends of the crankshaft and held with soldered washers.

The solenoid is energized by two spring-wire contacts, one of which bears against the crankshaft continuously, while the other only intermittently. The latter makes contact with a $\frac{1}{2}$ -in. steel disc, drilled off center to serve as a cam, and pressed over the end of the crankshaft. When the cam is in contact with the wiper wire for $\frac{1}{2}$ revolution of the flywheel, electric current energizes the solenoid coil and pulls the plunger back to provide the power stroke. At the split second the wiper wire breaks contact with the cam, the plunger is de-energized and returned to its forward position by the momentum of the flywheels and the cycle repeats. The engine will run on any toy-train transformer, as well as dry cells. The number of cells required will depend on the rated voltage of the solenoid to be used.

—W. D. Siprelle

All About Gutters

(Continued from page 164)

there. Two representative types of guards are shown on pages 160-161. Aluminum guards should only be used on aluminum gutters. For unpainted galvanized gutters, buy a galvanized-mesh guard. Should you not want to go to the trouble and expense of installing such guards, or in cases where such a guard is impractical because of the type of hanger used, you can try to get by with a cage-type strainer at the top of each downspout. At least it will keep any large debris from clogging the spout, where it's hard to locate and remove. (In the average system, there should be a downspout for each 30 ft. of trough).

When downspout clogging does occur (you can tell by pouring a bucket of water down each; if it flows out sluggishly at the bottom, you've got a clog) you can unplug it by squirting a hose down it, with the nozzle set for a top-pressure jet.

When you've finished the clean-out, inspect the inside of all troughs for any signs of dry rot, rust or corrosion, and do what patching is necessary. The aluminum-foil-in-black-cement patch demonstrated on page 159, is a cheap salvage job for either wood or metal gutters. Or use a self-adhesive metal repair tape of the type being applied to a downspout on page 162.

Now let's climb up onto the roof itself and take a look at your flashing. *PM* questioned several roofers and learned that nearly half of the repairs they undertake can be traced to flashing failures. This isn't surprising, since the roof is only as good as the seals along its valleys (where two roof-planes meet) and around the chimneys and vent pipes that poke up through it. To turn weather back at these points, roofers put in strips or sheets of galvanized steel, aluminum or copper. But it must be put in right.

"Just did a refashing job on a five-year-old home," one roofer told us. "A ½-in. gap had opened up between the chimney and the roof. This wouldn't have mattered if the flashing had been installed right, but the guy had tried to cut a corner by using a single piece on each side of the chimney, instead of a separate step and counter. When the house settled, something had to give."

This puts a finger on one vital aspect of flashing. Any frame structure is bound to settle. The chimney, however, stands firm on the foundation, so the flashing must be designed to close any gaps that develop as the roof shifts. The standard lapped-sheets system is diagrammed on page 163.

Another roofer told us: "This lady's roof was leaking like a sieve. When I

pulled off the shingles along the valley, I found the flashing eaten away. The character who installed it had used galvanized nails to fasten aluminum flashing." It's the gutter tip again: never mix metals.

When you suspect your present flashing is inadequate, it's often too much of a chore to pull it all up and replace it with new—especially where it's covered by shingles. But it's not difficult to reinforce it, creating a fresh seal. And you needn't worry about metal-mixing or roof punctures if you use asbestos felt or fiberglass flashing set in black plastic roof cement. You can buy these materials from any roofing supplier. The black cement is not ordinary roofing tar; it's asbestos-fiber packed, and runs as high as \$3 a gallon.

With a cold chisel (or screw driver) prod the mortar joint into which the rolled top edge of the chimney's counter flashing is inserted. If mortar crumbles and falls out to any great depth, this joint should be remortared. If only the top surface chips away, leaving solid mortar beneath, put a layer of the cement over the joint, after brushing away loose particles.

The method of reinforcing valleys is identical to that demonstrated in the roof-to-wall-joint photos on page 164. Just apply a band of cement down the length of the valley, extending 2 in. to each side. Run a strip of flashing material down this band, pressing it firmly and evenly in place. To make certain the edges are sealed, run a bead of cement along them.

Now, let the storms come! ★★

Rattle Up a Deer

(Continued from page 108)

the best time to make your rattling calls carry.

"Deer react to rattling in different ways," says Tinsley. "An eager one might plow right in on you, with blood in his eye. A more wary one might sneak around, looking and listening, reluctant to come closer. Often, in this case, a hunter should beat the antlers on the ground and slam the brush, to give the impression of a heated fight. The idea is to work on the buck's emotions until he can't stand it any longer."

Rattling your trophy buck within gunshot range works best when the open season on deer corresponds to the rut and a high ratio of bucks exist in the area you plan to hunt. In the western part of the country, where many trophy bucks are taken annually, "rattling" is becoming more popular among sportsmen since dense brush prohibits hunting deer by any other method. But it can be just as productive in the woods of the East. ★★★

Whatever the size of your job...
powerful parallel jaw grip
and tremendous leverage
...yours with

CHAN NEL LOCK®

the ORIGINAL
tongue and groove pliers

The most versatile pliers ever made . . . so say hundreds of thousands of men who every year buy and use CHANNELLOCK, the original tongue and groove pliers. Try one, buy one and you'll agree that here is the all 'round handiest tool of them all. Be sure it's a genuine CHANNELLOCK... look for the trade mark on the handle and for the exclusive patented features shown above.



1. Patented Reinforcing Rib for ADDED STRENGTH WHERE YOU NEED IT!



2. Patented Undercut Channels...SMOOTH-WORKING, CAN'T SLIP UNDER ANY LOAD!



CHANNELLOCK, INC. Meadville, Pennsylvania

Formerly Champion DeArmont Tool Co.

FREE Catalog showing complete line of hand tools... yours for the asking.



Village Blacksmith

(Continued from page 107)

came time to bring in the hay it was cut by about six men with scythes, each swinging that heavy tool in monotonous rhythm all day long. There was no break except an occasional pause to whet the blade of the scythe, and a single stop in the middle of the morning or afternoon to visit the spring and there drink from a jug that strange nonalcoholic brew called "switchel," which my aunt had prepared shortly after dawn. Later in the season came the reaping of the oats, when the same process was repeated, except that the men swung cradles instead of scythes. And since neighbor helped neighbor, the six men went on day after day teaming together until the fields of all had been cut. No modern production line could possibly be so monotonous an undertaking, and surely none could be so physically exhausting.

Today, most of this dreary hand labor has been eliminated. Harvesting is done with magnificent, but complicated, power equipment. The farmer who drives the mowing machine, or the reaper and binder, not only produces infinitely more than his grandfather did, but must be far more of a man. No wool-gathering for him as

he works! If he lets his mind wander just once he will be quite certain to wind up in the creek.

Tremendous change and improvement are likewise now going forward in the techniques of industrial production. Alert management everywhere is striving to give the individual employee the greatest possible opportunity to make a significant contribution to the success of the enterprise. Automation, while temporarily reducing the number of jobs required, greatly raises the level of skills demanded in those that remain. The supercraftsman who staffs the new equipment, like the farmer on the modern reaper, must be much more of a man than his predecessor ever was.

Sense of Achievement

No one can convince me that the skilled worker in a steel plant today—and nearly all such employees must be highly trained—does not feel the same thrill of achievement and the same pride of craftsmanship that shone on the face of my village hero when he had completed a particularly difficult task. Watch the maintenance man in a rolling mill when an unexpected cobbler occurs and the swiftly moving stream of hot metal suddenly begins to pile up. All eyes are on him as he rushes to the spot.

(Please turn to page 214)

EVERLITE* World's Thriftiest Light Plants



THE CHAMPION \$139.95

The Champion—1200 watts 115 volts AC for only \$139.95
Unbelievable but true—Brand new production methods now make possible world's finest design in a service free alternator light plant at this unprecedented price. Plant puts out a steady 1200 watts of 115 volt AC power to run power tools, oil burners, pumps, TV, or anything that requires up to 1200 watts. Powered by a rugged 3 HP, 4 cycle, easy start gas engine with 1 year factory warranty. Complete with carry handle and shock mounts. Why fool with short life 2 cycle plants when you can buy this rugged top quality machine at our factory price.
Item #1265—wt. 65 lbs.

HEATING AND VENTILATING FAN

(Item 10) Easily installed in furnace pipes. Forces even heat to rooms. Over range removes kitchen smoke and odors. Powerful, continuous duty motor, 110-120 v. AC. Mount in wall or ceiling to ventilate any area. Quiet, super-efficient fan moves huge volume of air, (400 to 900 CFM).
8" Pipe, wt. 6 lbs. (Item C10).....\$ 7.45
10" Fan, wt. 8 lbs. (Item 10E).....\$11.95
12" Fan, wt. 10 lbs. (Item 10D).....\$12.05
HEAVY DUTY FAN. Semi-enclosed motor, suitable for spray booths, restaurant exhausts, poultry houses, etc.



STANDARD DIAL PHONES WITH BELL

Bell System late model dial phones same as used by all telephone companies. Ideal as extensions on any system. Easy to connect. Several may be connected on one line. Easily modified for private inter-com system. Cost \$40.00 new—guaranteed excellent condition.
ITEM 855-NC, Wt. 8 lbs.\$8.45



Guaranteed reconditioned.
Item 355nc\$8.45 plus \$1.00 shipping
COLOR DIAL PHONES
Item 1281, Colored Phone—Gray, Beige or Blue.....\$12.50 plus \$1.00 shipping

MODERN WALL DIAL PHONE

A modern compact phone which hangs on the wall out of the way. Easy to install.
Item #1266 Wt. 8 lbs. Wall Phone.....\$12.50

Send 10c for 100 page Catalog FREE with order. Prices f.o.b. factory. Money back guarantee.

MASTER MECHANIC MFG. CO.

Send orders to nearest office.

Briggs & Stratton — Clinton New Gas Engine Sale



Clinton 2 1/2 hp. Md. 500—Re-coil starter Std. 3/4 shaft w. keyway—ready to go. Reg. price \$49.50
Special (item 1002)

\$29.95
2 for\$59.50
6 for\$178.50

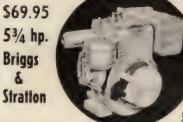


Briggs & Stratton 2 hp. Md. 60101 Hope start. std. 3/4 shaft w. keyway. Sturdy 4 cycle power. Regular price \$49.00
Special (item 1066)

\$29.75
2 for\$58.90
6 for\$178.50

Briggs & Stratton 3 1/2 hp. Md. 143502 Re-coil start. Std. 1" shaft w. keyway and adjustable governor—a rugged big engine ready to tackle any job. Regular price \$62.60
Special (item 1050) **\$69.95**

2 for \$135.00 6 for \$375.00
Remember these engines are absolutely perfect and standard and under factory warranty. Money back guarantee. Order now while stocks are complete. Factories—we buy engines.



\$69.95
5 3/4 hp.
Briggs & Stratton

TRUCK OR BOAT WINCH 2000#



A powerful, compact winch which installs easily even in limited space. Works with any 12, 24 or 32 volt system. Reverses under power—positive brake holds load. Drip proof cover. Remote control if desired. Drum holds 100 ft. of 1/4" cable. Speed 30 ft. per minute. A terrific winch at an economy price.
Item 1263
Wt. 55#\$59.50

Dept. A115

Box A, Burlington, Wis.

Box 65, Sarasota, Fla.

Don't buy batteries—Save \$—Recharge them!

over and over up to 15 times or more
the **EVERLITE**—the best
charges more
than all the rest.

Only the New EVERLITE

- Charges 6 at one time.
- Charges 3 times faster.
- Charges all batteries.

only **\$6.95**

Be prepared. Always have fresh batteries when you need them. The EVERLITE is the only charger made which charges all batteries, flashlight, lanterns, toys, radio, telephone, hearing aids, cameras—yes even mercury cells. Save money and have the convenience of fresh batteries always.

The EVERLITE is the best—the **only** charger built with a powerful magnetic energy winding. This power enables it to charge big lantern batteries and even car batteries. Also plays transistor radios on 115V. house current charging the batteries at the same time. **Charges all batteries better.**

Two models—the EVERLITE 75 for all dry cell batteries up to 12 volts and the EVERLITE 76 for all dry batteries plus a special charge for car batteries to assure fast starts on cold mornings. Simple, safe, fool-proof and unbelievably efficient. Plus into any 115 volt outlet. Guaranteed for one year. Send for your EVERLITE now—10 day money back guarantee.—You must be satisfied.

New
Transistorized
Model
only
\$6.95



Free battery tester and adapter for special batteries included.
The EVERLITE 75—Send \$6.95 plus \$.65 for shipping.
The EVERLITE 76 (including car battery kit)—Send \$8.95 plus \$.75 for shipping.

COPY ANY CONTOUR INSTANTLY Perfectly Accurate Every Time.

SAVES HOURS—SAVES MATERIAL. Can pay for it—self on one job. The perfect tool for fitting in against door casings, bath fixtures, mouldings, pipes, sinks, masonry, etc. A real boon to pattern makers, sheet metal mechanics, tool makers and body men.

EASY TO USE—just push the gauge leaves against any contour and lock. A perfect template every time. Works against any surface or any material. Immediate delivery guaranteed.

Order now from MASTER MECHANIC CO.

Send \$1.00 deposit if you wish C.O.D. shipment.
All items guaranteed for 1 year plus 10 day moneyback guaranteed.

Mail order to Master Mechanic Co. Dept. A115
Box A, Burlington, Wisc., or Box 98, Sarasota, Fla.

Send ☐ EVERLITE 75 chargers \$6.95 ea. plus .65 shipping.
Send ☐ EVERLITE 76 chargers \$8.95 ea. plus .75 shipping.
Send ☐ No. 1 Contour Copies \$6.90 ea. plus .55 shipping.
Send ☐ No. 2 Contour Copies \$9.90 ea. plus .65 shipping.

Name
Address
City State Zip

CONTOUR COPY

PATENTED



A PRECISION LIFETIME TOOL—\$6.90

Made of hardened aluminum alloy—will retain its accuracy indefinitely.

Size No. 1 is 4 1/4" x 4 1/4".....**\$6.90**
Size No. 2 is 7 1/2" x 4 1/4".....**\$9.90**



If you start
daydreaming at
work about a great
autumn day
in the woods,

the man next to you
must be smoking
Field & Stream.



A product of Philip Morris Inc.

U. S. Oil & Gas Lease Drawing **PUBLIC POSTING** By Government Regulation

OPPORTUNITY TO WIN valuable (GIVEAWAY) oil leases in United States Government public drawings monthly by U. S. citizens. Winners awarded oil leases in prolific producing areas promptly salable for large profits. \$10,400.00—\$8,000.00—\$7,800.00—\$7,000.00—among recent winnings by our clients. For amazing information and how to share write:

Federal Oil Lease Service
P.O. Box 867-PM, Ft. Worth 1, Tex.

Village Blacksmith

(Continued from page 212)

No two such mishaps are alike, and this man feels the same trepidation that the blacksmith did when a horse which he had never seen before, and which he was trying to shoe, suddenly began to kick. The mechanic must make up his mind in a split second what to do, and if his quick and decisive action turns out to be right and the machinery begins to move properly once more, the glow of pride shining from his countenance tells more vividly than words the depth of satisfaction which has come to him.

There is, of course, one further break with the past, and it is one that nothing can be done about if we are to maintain the forward thrust of our economy. Large-scale production and nationwide marketing make it impossible for the particular individual who has mastered his craft to be identified, in the mind of the consumer, with the article sold. The purchaser of a new automobile never knows the name of the imaginative draftsman whose creative mind first conceived the change in design for the new type of fender, let alone the name of the company which produced the steel, or that of the maintenance man who kept the rolling mill from breaking down.

Time for Hobbies

That is the price we must pay for our vastly increased standard of living. But there is a marvelous offset: the increase in leisure time which has come into the lives of workers. When I first came into industry, a working day of two 12-hour shifts and a work week of six days were still common. Under those conditions, the man who had but 12 hours to himself, out of which had to come time for meals, sleep and travel to and from his place of employment, had no spare time for an opportunity to develop his handicraft skills.

Today the door of opportunity stands wide open for those who have the self-discipline and the imagination to bring to perfection the manual skills with which nature endowed them at birth. Let us remember that the great art of the world has always been self-generated. It has been created in response to the deep inner urge of the spirit, and has never been a mere function of vocation.

The woman who devotes her winter months to making new drapes for her living room will have for years thereafter a daily reminder of the happiness which she has brought to her family. My mother was never able to do that. To begin with,

(Please turn to page 216)



PLUMB

FA57 HAMMER

- **NON-BREAKABLE FIBER-GLASS HANDLE**
Guaranteed not to break, bend or collapse in normal use
- **MOLDED DURA-CUSHION GRIP**
Non-slip • Absorbs shock • Reduces fatigue
- **PERMABOND®** • Keeps head & handle tight

**BUY THE BEST
... BUY PLUMB®**

FAYETTE R. PLUMB, INCORPORATED • PHILADELPHIA, PA. 19137

Talking Guns

Shooting bullets into water may become a way to signal or navigate at sea. A Navy scientist, who has been firing bullets into water tanks, says differently shaped bullets make different sounds as they enter the water and these could be used to signal a submarine or—combined with an array of underwater microphones—could enable a low-flying plane to determine its position.

Lenses for Skin Divers

Underwater contact lenses that have been tested at depths greater than 100 feet have been developed by a Navy surgeon and a civilian optometrist. For a skin diver with normal vision, the new lenses permit clear underwater vision without goggles or face masks. They can also be ground

to a prescription. Bigger than ordinary contacts, the new ones cover most of the eye so that the eyelids help hold them in place. The Navy's interested in them for use by its underwater demolition teams, since face masks and goggles sometimes become a hazard when they jam against the face from the force of an underwater explosion.

Flashy Submarines

Identifying a submarine will be easier for boatmen in the future. The Navy is installing a rotating amber light that will flash 90 times a minute and be visible for three miles on each of its submarines when they're operating on the surface. The low-lying, dark-colored subs have been collision prone in the past because they're difficult to see and are often mistaken by boats for smaller craft.

FINISHES TRIM

Indo WOOD SEALER AND SATIN FINISH

Primes, seals, finishes. Enhances natural beauty of wood. Dries fast. Odor-free. For trim, woodwork, furniture, doors, and paneling. Can be sanded and recoated in two hours. Sold at leading hardware, building supply, paint and specialty stores.



DAP

DAP INC., Dayton 31, Ohio
SUBSIDIARY OF *Plough, Inc.*

**MOST
POWERFUL
PORTABLE
HEATER
FOR ITS SIZE**



Now with exclusive safety control. Designed for unattended operation. In cottage, garage, workshop or on the job. Circulates full heat instantly. 50,000 BTUs! Runs over 10 hours on 1 tankful of low-cost kerosene. Weighs only 42 lbs. \$114.95. Standard model \$99.95. F.O.B. Factory. (Prices slightly higher West Coast.)

REDDY HEATER Co., 333 W. First St., Dayton, Ohio 45402

Please send free REDDY HEATER folder. (B)

NAME _____

ADDRESS _____

CITY _____ STATE _____

REDDY HEATER

Village Blacksmith

(Continued from page 214)

there were no fabrics available comparable to the fine ones which any housewife can buy today. But even if these had been available, she had no time. She had no gas or electric range, no washing machine or dryer, no vacuum cleaner. She rushed madly about all day, carrying coal up a flight of stairs for her kitchen stove, washing clothes with a scrubbing board and a galvanized tub (which had to be brought into the kitchen from the back porch) and filling the tub with water that had previously been heated in kettles over a long time.

"Do it yourself" is now a national pastime. Many a homeowner not only paints his own house, but puts a new roof on it. On winter evenings he may be in the basement making a new table for the playroom. On Fourth of July weekends, when I see a stream of boats on trailers heading north and northwest out of Chicago for the Wisconsin lakes, I know that many of them were built in garages over the winter.

Up to the Individual

The variety of personal skills which may be developed on a spare time basis is infinite. It all depends upon the will of the individual to improve himself. I had a friend whose father had actually been a village blacksmith. So to perpetuate the family tradition he put a forge and anvil in his basement, and turned out extraordinary bits of ironwork for the benefit of his neighbors.

I know a banker whose passion is music and who can hold his own playing alongside professionals in a community symphony orchestra. And if the primitive tribes in Africa can produce native carvings which are eagerly sought by the great museums of the world, why cannot we Americans with a number of modern precision tools at our command do at least as well?

So let us not waste time in being sorry for ourselves by looking back nostalgically to the days when the man who made the pump handle also brought it to the kitchen and installed it. Let us rather accept the fact that the days of the village blacksmith are gone forever, and be grateful for the change.

Let those who lament the passing of human skills in industry set an example in their own communities by demonstrating how effectively their creative effort can find expression during their growing periods of leisure time. ★ ★ ★

Disston

"Diss-Chrome" Circular Saw Blades

have an edge on them all



"Diss-Chrome"™ circular saw blades make any home workshop project easier. Cuts are cleaner and faster; work goes together neater.

There is a Disston "Diss-Chrome" blade style for any kind of cut—rip, cut-off, combination, planer, flooring and a special plywood blade. All popular sizes available with universal arbors for use with most bench or portable saws. Each

blade is hardened, tempered and chrome-plated to provide extra long life. Blades are individually packaged.

Add to your ability with Disston "Diss-Chrome" blades. Your hardware dealer stocks them and will help you select the right blade for your job. Or write: Hardware and Industrial Products Division, H. K. Porter Company, Inc., Porter Building, Pittsburgh, Pa. 15219.



**HARDWARE AND INDUSTRIAL
PRODUCTS DIVISION**
H. K. PORTER COMPANY, INC.

Disston also makes finest quality hacksaw frames and blades.



TABLE-TOP CAR RACING



A Popular Mechanics book tells how the fun started . . . how you can build the scale model cars, realistic track and scenery . . . and how to race these free wheeling little cars in a wide variety of scale sizes.

It is all here including a list of manufacturers of parts and components. \$4.95 plus postage. Popular Mechanics Books, 575 Lexington Ave., New York, N.Y. 10022

PM Project-a-Plan Slides

NOW AVAILABLE In FULL COLOR



Project your Christmas patterns to any desired size by slipping these slides into any 35-mm. projector. Project on hardboard or plywood panel, trace enlargement and saw to shape.

- C 104 Santa Caught in Chimney . . . \$1.00
- C 105 Bewildered Santa, deerheads . . \$1.00
- C 106 Santa with Reindeer Pyramid . . \$1.00

Full-color slides of projects on page 142 also available:

- D 101 Short Santa, Tall Hat . . . \$1.00
- D 102 Child Carolers . . . \$1.00
- D 103 Nativity Scene . . . \$1.00

Any three slides for \$2.50. Address Project-a-Plan, Popular Mechanics, 575 Lexington Avenue, New York, N.Y. 10022.

They're Burning a Memorial

(Continued from page 137)

original steel-support structure, enabled workmen to operate safely.

Next, modern industrial jet torches were purchased and improved upon to do the job. Burning a mixture of kerosene and liquid oxygen, these water-cooled torches are actually miniature jet engines capable of burning a channel 3 inches wide, 4 feet deep and 20 feet long into solid granite in two and a half hours. Their cutting flame roars from the torch's mouth at a velocity of 2800 feet per second and a temperature of from 3000 to 3500° F.

Directed by George Weiblen, who worked with Lukeman in 1928, this new breed of mountain carvers uses standard engineering techniques to plot dimensions of the original models in their proper scale on the face of Stone Mountain. Next, holes are drilled into the granite at key points, their varying depths indicating the precise amounts of stone to be removed by the big jet torches. After the heavy cutting is completed, a smaller torch is used for more detailed work. The final step consists of smoothing contours.

Roy Faulkner, chief carver at Stone Mountain, is enthusiastic about the technique of burning in modern mountain carving. "The torches give us a much cleaner finish than blasting," he declares. "Blasting produces tiny spiderweb cracks which penetrate deep into the stone. Over the years they will tend to enlarge due to moisture penetration and changes in temperature. Burning off the granite with torches leaves no such cracks. When we finish an area there's not a crack anywhere. It's all perfectly solid.

"On the other hand," he continues, "We have to remember that there's an element of danger in using these torches. "If the fuel hoses should rupture and ignite, catching a man on the scaffold, he would either have to jump or burn to death. There would be no way to escape."

During the first seven months they were in use, the torches burned off as much stone as could have been removed in from 18 to 24 months using older methods.

To achieve the relief called for by the sculptor's original models, the workmen have penetrated as deep as 12 feet from the carving's outer plane, and a total distance of 42 feet inside the mountain's face. They are a dedicated group who enjoy their unique work and look forward to finishing in a minimum of time.

"After all," Roy says, "when the job is done we want everybody who sees it to be proud of it." ★★ ★

Fix sticking automatic chokes fast . . .

GUMOUT AUTOMATIC CHOKE CLEANER

FREES

STICKING CHOKES

Simply squirt on both ends of choke valve shaft, then remove the choke cover and flood vacuum cylinder while the engine runs. It's fast!

CLEANS

CARBURETOR LINKAGE

Dirty, oily linkage can badly foul up carburetor performance. Now you can clean it in seconds!

LOOSENS MANIFOLD

HEAT CONTROLS

Quickly penetrates and frees heat controls frozen by rust and carbon. Leaves no oily residue to form carbon and cause further sticking.



\$139

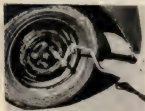
AT LEADING
AUTO SUPPLY STORES

CLEANS and FREES
• automatic chokes
• manifold heat controls
• carburetor linkage

GUMOUT DIVISION, PENNSYLVANIA REFINING CO., Cleveland 4, Ohio

WHY STRUGGLE

Why struggle with old fashioned Wheel Wrenches? The new patented* Levermaster facilitates wheel changing.



A



B

For increased leverage, step on it (A); then spin nuts off by hand (B). The Levermaster is plated and has wheel cover removal and jack handle features. State nut size and send \$2.90 money/postal orders.

H. Leps Dists. Co., Room 505, 60 Esther Lorrie Drive
Rexdale, Ontario, CANADA.

*Patented U.S.A., Canada, U.K.

NOV. 1965

GOV'T. SURPLUS AND OTHER BARGAINS SAVE UP TO 90%



AC-DC GENERATOR rated 200 AMP DC @ 24 to 30V. Also produces 1200 watts of AC current. Excellent for making your own arc welder. Also for lights and many cooking accessories. Size 14" L. x 6" dia. Tested prior to shipment. Shpg. wt. 55 lbs. Approx. GOV'T COST \$350. Special **\$14.95**

DC JET GENERATOR ARC WELDING KIT complete with GE Type CM Gen (30 V. D.C., 400 AMP, 3000 RPM; ampere rating is for continuous duty, intermittent amperage is 500 to 600 amps). Also 2 rheostats, 1 voltage reg., 1 volt-meter, 1 electrode holder, 1 welder's mask, 1 toggle switch, 10 lb. vacuum packed 3/8 in. welding rods, pair welder's gloves & splicing coupling. All units guaranteed pre-tested. Wt. 110 lbs. Approx. GOV'T COST \$700. All items **\$64.50**



ELECTRIC STORAGE BATTERY WINCH

For use on 12 V. D.C. Heavy-duty ball bearing construction 160:1 gear reduction. Reversible spool will handle 1/4" x 1/4" cable. 2000 lb. capacity. Ready to install & operate. 19" L. x 9" W x 8" H. Excellent for jeeps, trucks, boats, etc. Complete with mounting bracket. Shpg. wt. 60 lbs. Approx. GOV'T COST \$400. New Model E. 90-day guarantee. **\$59.50**



HEAVY DUTY MAGNET Fantastic power, will pull 125 lbs. on steel bolt. Excellent as underwater retriever. Picks up all ferrous metals. Dim. 4" x 2" x 1 1/4". **\$7.95**



NEW! BIG! 1965 CATALOG

Send 25¢ for amazing catalog with 1000's of bargains in hydraulics; electrical, marine, automotive items, etc. Order from ad. Prices FOB. 50¢ deposit for COD. Plus include your zip code number. Satisfying mail order customers thru-out the world since 1945.

AIRBORNE SALES CO. Dept. PM1165

8501 Stellar Dr. • Box 2727 • Culver City, Calif. 90231

219



For 1966, a Chevelle with a quick set of reflexes: SS 396.

We refer, of course, to our already famous 396-cubic-inch Turbo-Jet V8. Rated at 325 hp, it's the motive force beneath the hood of every Super Sport 396. Unless you happen to specify the 360-hp version with a wilder cam. Torque in either case is over 400 lbs. ft.

We also refer to the car's remarkable handling ability, proof of which is the nearest twisting road. Stiffer springs and matching shocks are standard at all four

wheels. So are red stripe tires and wide base rims, along with a heavier front stabilizer bar and a special rear axle. There's even a floor-mounted, fully synchronized 3-speed transmission and many other special items.

Need more convincing about this Chevelle's quick reflexes? Find yourself an SS 396 owner. If you can lure him away from the wheel long enough, get him to let you drive. Otherwise, see your Chevrolet dealer.



Chevelle Super Sport 396 Coupe

NEW **CHEVELLE SS 396** **by CHEVROLET**

Chevrolet Division of General Motors, Detroit, Michigan

New from Du Pont



Does 2 jobs!

1. It's a sealer

stops leaks saves costly overhauls

2. It's a tune-up

restores transmission additives to a safe level

Add T-seal to your transmission

- when fluid level is low
- when you change fluid
- if transmission is rough or noisy
- if it is leaking
- if it is slipping
- every 10,000 miles

Safe for every car with an automatic transmission

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY



Brain Control by Radio

(Continued from page 132)

among the brains of different persons. That is, stimulation of the same region of the brain in different persons can produce quite different behavioral responses. The reason for this, according to Dr. Delgado, is that the organization of brain physiology—the way it works in directing thought and action—depends greatly on the experiences a person has had.

Factors Modify Effects

Another reason is that stimulations of the brain do not produce blindly automatic responses. ESB can often be overridden or modified by other mental or physical activities of the individual. Thus, the stimulated reactions become integrated into social behavior according to the individual's own personality, experience, desires, drives, and attitudes, and depend also upon the circumstances in which the stimulus was given.

For example, the stimulation of at least five regions of the monkey brain which produce aggressiveness will send the animal into a rage. Usually, however, it will not attack just any member of the colony. Rather, it will tend to make "intelligent" attacks on monkeys that are challenging its authority or weaker than it.

"The behavior of a group of monkeys," says Dr. Delgado, "is an entertaining spectacle, and a few minutes' observation gives the impression that their playing, grooming, chasing and comic activities are rather unpredictable. Long-term studies, however, have shown that individual and social behavior is predictable within a known range of variability. The study of group behavior is possible precisely because of the recurrence of patterns which can be identified."

The Spanish-born neurophysiologist identifies such patterns by making time-lapse motion pictures of his monkey colony, taking one frame every few seconds day and night (when infrared illumination and special film are used) and then scoring each monkey on various measures of behavior, such as walking, sleeping and picking. By assigning units of time and space to those activities—how long a monkey groomed, how far it walked—Dr. Delgado develops a complete behavior profile for each animal for purposes of comparison.

One experiment involving such an interaction and mutual effect of stimulated and nonstimulated monkeys revealed that one monkey could learn to use ESB to control the behavior of another.

That was done by connecting a radio

(Please turn to page 224)

- a. ceiling tiles
- b. upholstering furniture
- c. shelf trimming
- d. valances
- e. draperies
- f. window shades
- g. fencing

PLUS

- recovering table and chairs
- wall decorations
- insulating
- bulletin boards
- hundreds of other uses indoors & out



**THIS SWINGLINE
TACKER GUN SAYS
can do
TO ALMOST EVERYTHING**

Swingline INC.

LONG ISLAND CITY, NEW YORK 11101

WORLD'S LARGEST MANUFACTURER OF STAPLERS, TACKERS AND OFFICE

and what a honey of a gun it is!

A real Heavy Duty Gun—"open-channel" loading for quick, easy staple replacement—easy action handle—exclusive power-dot for greater staple penetration—handle lock—built-in staple extractor—takes 5 staple sizes plus special Loktile® staples for ceiling tile installation.

Swingline 800 Heavy Duty Tacker Gun only \$7⁹⁵

at hardware, department, variety and stationary stores

Also available: All purpose No. 101 High

Compression Tacker Gun. Takes 2 staple sizes. only \$4⁹⁵

MORE NEWS FROM HONDA—



© HONDA, 1965



**THE HONDA G-30 GENERAL PURPOSE ENGINE
HIGH PERFORMANCE IN A LIGHTWEIGHT AND COMPACT DESIGN**

The Honda G-30 is another fine product from the world's largest manufacturer of motorcycles and quality power equipment. A high-performance, general-purpose engine perfect for a wide variety of jobs ranging from farming to forestry; construc-

tion to light gardening. Especially suited for powering lawnmowers of all types, this versatile and rugged performer is interchangeable with almost any other similar-range engine. Most important of all, the G-30 is a HONDA.

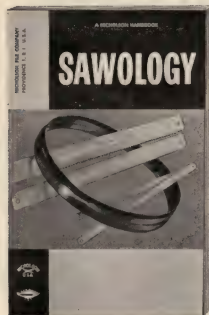
Honda G-30: Four HP @ 3600 rpm • Four-stroke engine • Recoil Starter

HONDA

You're Always Ahead With Honda—Products of Creative Research

For name of nearest dealer or other information, write: American Honda Motor Co., Inc., Department F, 100 West Alondra Boulevard, Gardena, California. Dealer inquiries invited!

SHARP KERFS START HERE!



Take a quick glance through our 34-page booklet, "Sawology." All the information you need for clean, correct sawing is there—plenty of easy-to-understand material on using hand hacks, power hacks and band saws.

Best of all—the book is free. Just mail the coupon. You'll get your next sawing job off to the right start. "Sawology" tells you how.

NICHOLSON FILE COMPANY

Dept. PM4, Providence, Rhode Island 02904

Please send me your free booklet, "Sawology."

Name

Address

City State Zip Code



NICHOLSON



Nicholson File Company, Providence, Rhode Island
Files • Rotary Burs • Hacksaw and Band Saw Blades
Hole Saws • Ground Flat Stock • Industrial Hammers

Brain Control by Radio

(Continued from page 222)

transmitter to a lever put through a hole in the wall of the cage where the monkeys could press it. When they did so, a radio signal would stimulate a region of the brain of a particularly hostile monkey and inhibit its aggressive behavior. Dr. Delgado explains that it took only a few days for the most harassed monkey in the colony to learn the value of that lever and to use it whenever it was chased.

Busy Monkeys

Another experiment involved what Dr. Delgado calls sequential behavior. Stimulation of a region of the brain called the red nucleus caused the following series of activities: The monkey stopped what it was doing, changed facial expression, turned its head to the right, stood erect on two feet, climbed a pole, descended to the floor, made low vocal sounds, threatened other monkeys, changed attitude and peacefully approached others, and finally resumed what it had been doing.

The most remarkable thing about that and other similar performances is that the whole sequence would be repeated again and again whenever the red nucleus was stimulated. Only details in the activities varied, and then just to allow the monkey to avoid obstacles, to run from a threat, to eat and sleep. The "remarkable reliability of responses" was maintained, according to Dr. Delgado, even in an experiment that involved more than 20,000 stimulations given every minute for two weeks.

How does the application of an electrical charge to a region of the brain elicit so complex an array of responses so reliably? No one knows yet, but Dr. Delgado believes that ESB serves merely to trigger a highly complex system of nerve connections which normally are activated by other factors, such as emotional perceptions, memories and motivations of various kinds.

"The uniqueness of voluntary behavior lies in its wealth of [such] 'starters,' each one of which depends on a vast unknown integration of past experiences and present receptions," explains the doctor.

Determining how those vast and unknown integrations produce social behavior will require the development of major new theories, Dr. Delgado believes, because the materialistic theories of today "are not sufficient to explain reality."

The task of ultimately explaining reality, he thinks, will demand the exploitation of what he calls "the most suitable kind of feedback mechanism: the human brain studying the human brain." ★ ★ ★



EXPLORE The Exciting
World Of Electronic Kits
With This New **FREE**
1966 **HEATHKIT®** Catalog!

Heathkit ... world's largest electronic
kit line — now bigger and better than
ever!

- bigger selection - over 250 kits!
- greater savings - up to 50%!
- unmatched quality!

**MAIL
TODAY!**

**PLEASE SEND MY FREE
1966 HEATHKIT® CATALOG**

Name

(Please Print)

Address

City

State

Zip



HEATH COMPANY
Benton Harbor, Michigan 49023

PLACE
5c
STAMP
HERE

There's something for everyone
in the new
HEATHKIT® CATALOG
— truly the finest selection and
savings ever offered kit builders!



STEREO /HI-FI EQUIPMENT...
Changers, tuners, amplifiers and speakers — tube type or all-transistor — mix or match for the finest in stereo listening at savings of up to 50%!



FOR THE ENTIRE FAMILY ...
Color TV, B & W TV, AM FM Short-wave portable and table model radios, intercoms, garage door opener, citizen's band radios, electronic organs, automotive equipment at big kit savings.



HAM RADIO EQUIPMENT ...
Choose from a complete selection of transmitters, receivers and accessories recognized by hams the world over for quality.



ELECTRONIC TEST EQUIPMENT ... For work or workshop, engineers & technicians rely on quality-design, economical Heathkit test gear.



MARINE GEAR ... Direction finders, depth sounders, tachometers, power converters and radiotelephones to outfit your boat for safe cruising — economically!

Send for your **FREE** Heathkit Catalog now!

FREE CATALOG.

*250 "Do-It-Yourself"
Electronic Kits At
Up To 50% Savings*

WHY BUILD HEATHKIT ELECTRONICS? A desire for top-quality products at 50% savings, to be sure. But it goes beyond that. The reason people choose Heathkit is pride. Not just the pride of owning something new, but something a bit better than you have created yourself! From watching your Heathkit grow and take shape from your own efforts. It's a labor of love and a lot of fun. The large pictorial diagrams and simple, step-by-step instructions make it easy. And when you finish and turn it on you'll know that unique self-satisfaction that comes with "do-it-yourself." You will have joined the millions of people, from ages 11 to 79, people with no special electronic skills or knowledge, who successfully build Heathkits. People like you! Give it a try. Your FREE Heathkit catalog is waiting for you now.



World's Largest Selection Of Electronic Kits



NEW Low Price On Heathkit
21" Color TV ... Only \$375.00



NEW Transistor FM Stereo
Tuner That Assembles In 6
Hours Or Less ... Only \$49.95



NEW Low Prices On
Many Heathkit Stereo/Hi-Fi
Components



NEW Deluxe Shortwave
Radio ... Only \$84.95



NEW 23-Channel, 5-Watt
All-Transistor CB Transceiver...
Only \$89.95

- ★ See The Vast Selection Of Portable And Table Model AM, FM and Shortwave Radios
- ★ See The Famous Heathkit/Thomas Transistor Electronic Organs
- ★ See A Complete Selection Of Home & Hobby Items ... Intercoms, Garage Door Opener, Automotive Kits, Tools, Color TV Sets
- ★ See All Heathkit Stereo/Hi-Fi Components ... Tuners, Amplifiers, Speakers, Turntables, Cartridges, Furniture
- ★ See The Full Complement Of Heath Marine Electronics
- ★ See The Complete Line Of Citizen's Band Radio Gear ... Transceivers, Walkie-Talkies, Accessories
- ★ See The Wide Selection Of Heath Educational Kits For Home Or Classroom Study
- ★ See The World's Largest Line Of Amateur Radio Gear
- ★ See The Full Line Of Heathkit Lab & Test Instruments For Home Workshop, Industrial & Educational Use



**MAIL
COUPON
FOR YOUR
FREE
COPY**

HEATH COMPANY, Dept. 17-11
Benton Harbor, Michigan 49023

☐ Please send FREE 1966 Heathkit Catalog

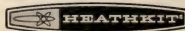
Name

Address

City State Zip

Prices & specifications subject to change without notice.

CL-215



The most useful gift you can give or receive



Weller® DUAL HEAT SOLDERING GUN KIT



ELECTRICAL REPAIRS



METAL MENDING



HI-FI KIT BUILDING



HOBBIES AND CRAFTS

Be sure it's a Weller. More Weller soldering guns are sold than all other makes combined. Unmatched for value, features and performance.

Heats fastest. Reaches full soldering temperature faster than any other soldering gun. No waiting.

Trigger-controlled dual heat. A Weller exclusive. Two trigger positions let you switch instantly to high or low heat to suit the job.

Kit includes: Weller 100/140 watt dual heat gun, 3 soldering tips, tip-changing wrench, flux brush, soldering aid, solder, break-proof plastic case. Model 8200PK. **\$895** list

WELLER ELECTRIC CORP., Easton, Pa.
WORLD LEADER IN SOLDERING TECHNOLOGY

Giant Steps to the Moon

(Continued from page 120)

After you've built a 365-foot rocket and strapped it to a 446-foot tower, how do you get them out of the building? You roll them right through the garage doors, of course. Each bay has a huge opening shaped like an inverted T. The doors at the bottom of the T roll horizontally, like barn doors, to permit the 140-foot-wide base of the launching tower to pass through. Seven overhead doors, on the stem of the T, slide up and stack at the top of the building. Although faced with aluminum, these seven doors each weigh from 32 to 73 tons.

The crawler-transporter, heart of the facilities, is by far the largest and most complex land machine ever built. It moves on eight steel treads, each with 47 links or shoes; and each seven-foot-long shoe weighs more than a ton. Thus it wears almost a million pounds of footwear.

The entire machine weighs 5.5 million pounds, and has the muscle and precision to balance a skyscraper twice its weight. Loaded with the moonrocket and its mobile tower, this odd vehicle will weigh a walloping 17.5 million pounds. It would sink out of sight in the Florida sands if it wandered off its special roadway.

The highway, already built, runs only 3½ miles, from VAB to the launching pads. Eight feet thick, it is built up of highly compacted fill and crushed rock, then paved in parallel strips 90 feet apart.

The width of the roadway is comparable to that of an eight-lane divided expressway. But this expressway to the moon has the lowest speed limit of any road ever built. The moonrocket will be trundled along at about one mile per hour. The most ticklish part of this trip will be the ramp climbing to the top of the pad, 48 feet above grade level.

The crawler, after depositing its load, will rumble to a nearby parking lot and return with the mobile arming tower. This structure, almost as high as the launch tower, will give technicians access to every part of the space ship as they fuel it and install the rockets.

These are the most dangerous hours. The highly volatile fuel could unleash an awesome amount of energy. If any spills on the pad, an alarm would sound, and anyone on the launching tower immediately starts the wildest trip ever devised. First he'll scramble into the high-speed, self-service elevator and push the bottom button. Within 36 seconds the door will open onto the deck of the tower base.

Then he will leap out the door, dive

(Please turn to page 230)



**Lace 'em
You'll love 'em**

Lacing couldn't be easier than with these Montgomery Ward boots. You do it with one pull. The boots are built for comfort, too . . . and protection from the elements. They have oil-treated leather uppers, insulation throughout and . . . oil-resistant Du Pont Neoprene on the bottom. Soles and heels of "Neoprene" mean long wear in a QUALITY boot. Buy Speed Lacers at any Montgomery Ward Retail or Catalog store or order by mail from Ward's Fall Catalog.

No. 7169, E width, sizes 7-11, and 12, EE width, sizes 8-11, and 12. Price, \$17.99.



NEOPRENE
Synthetic Rubber

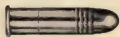
**Better Things for Better Living
... through Chemistry**



f.p.s.

F.p.s. (feet per second) means velocity. You get more of it in a Remington "Hi-Speed" 22 with "golden" bullets. More f.p.s. at 50 yards than ordinary 22's have at the muzzle! Greater penetration and wallop. In shorts, longs or long rifles, solid or hollow point. See your Remington dealer.

"Hi-Speed" is trademark of Remington Arms Company, Inc., Bridgeport, Conn. 06602.



Remington 

A New FREE BOOK for

MEN PAST 40

Troubled With Getting Up Nights, Pains in Back, Hips, Legs, Nervousness, Tiredness.

This new Free Book tells that if you are a victim of the above symptoms, the trouble may be traceable to Glandular Inflammation . . . a condition that very commonly occurs in men of middle age or past and is often accompanied by despondency, emotional upset and other mental and nervous reactions.

The book explains that, although many people mistakenly think surgery is the only answer to Glandular Inflammation, there is now a non-surgical treatment available.

NON-SURGICAL TREATMENTS

This New Free Illustrated Book tells about the modern, mild, Non-Surgical treatment for Glandular Inflammation and that the treatment is backed by a Lifetime Certificate of Assurance. Many men from all over the country have taken the NON-SURGICAL treatment and have reported it has proven effective.

The Non-Surgical treatment described in this book requires no painful surgery, hospitalization, anesthesia or long period of convalescence. Treatment takes but a short time and the cost is reasonable.

REDUCIBLE HERNIA | HEMORRHOIDS

Men-Surgical treatment for both Reducible Hernia and Hemorrhoids, the book explains, can usually be taken at the same time as treatment for Glandular Inflammation.

This new Free Book is fully illustrated and deals with diseases peculiar to men and women. It tells HOW and WHY New Modern NON-SURGICAL Methods are so successful today. Fill Out Coupon.



Excelsior Medical
Clinic, Dept. M 6150
Excelsior Springs, Mo.

Gentlemen: Kindly send me at once, your New FREE Book. I am interested in full information. (Please Check Box)

☐ Glandular
Inflammation

☐ Hernia
☐ Hemorrhoids

Name.....

Address.....

City.....

State.....

Giant Steps to the Moon

(Continued from page 228)

into a three-foot opening and slide 90 feet down a stainless-steel tube coated with Teflon, one of the slipperiest materials ever developed. He'll sail out into a room 60 feet long in the earth beneath the pad.

According to preliminary calculations, he'll be hitting 40 mph when he enters the room and crashes into the far wall. This would be suicidal if the wall were not covered with foam rubber almost a foot thick. However, the wall won't just stop him; it will bounce him back. What direction he takes then is anybody's guess. To solve this rebound problem, the entire room, including floor and ceiling, is covered with a thick cushion of foam rubber, and the fleeing man will bounce like a handball.

When he finally comes to rest, he'll stagger through a heavy steel hatch, slam it shut behind him, and find himself in a hemispherical, cave-like chamber completely isolated from the launching pad by heavy steel springs. Hastily he'll strap himself into a contour chair and contemplate his possible future while awaiting the explosion, just feet above his head, of enough high-energy fuel to blast a 45-ton boulder to the moon.

Such a flight from disaster probably will never occur. For 10 days the rocket will sit peacefully on the pad while technicians pour in the fuel and the astronauts complete their final check-out of the spaceship.

Then, on the tenth day, with the moon moving precisely along its predicted arc, the astronauts will climb into their cramped vehicle. An alarm will sound and everyone will flee the pad. The three men will sit alone atop the biggest bullet ever built, a bullet that weighs as much as the nuclear submarine *Nautilus*.

Their closest companions will be 3½ miles away in a plush room that contains all the nerve endings from the rocket. Designer Urbahn has called the Launch Control Center "not so much a building as an almost-living brain."

Here scores of NASA experts check computer read-outs and watch the TV pictures from 85 different channels built into the pad area. Behind heavy plastic windows, comfortably seated in deep armchairs, VIPs from all over the world watch developments on huge projection-TV screens built into the wall.

The countdown drones on until, during the last seconds, the visitors swing around to peer out through special soundproof windows. The rocket lifts off, slowly gathering speed, until at last, far out of sight, it is hurtling along at 25,000 mph toward its rendezvous 239,000 miles away. ★★ ★

champing at the bit
for a really cool pipe?

LIGHT UP A

Kirsten

Kirsten's patented Duralumin Radiator stem not only produces a cooler draw, but condenses out harsh and harmful tobacco impurities. Moisture easily is removed with a flick of the exclusive Kirsten valve. Featherweight Sportsman model features premium imported Mediterranean briar and hand-finished vulcanite bit. Order yours by mail today. Just \$7 Postpaid.

SEND FOR YOUR FREE CATALOG

20 pages of full-color illustrations of all the Kirsten models up to \$18.50

KIRSTEN PIPE
CO., Inc.

Dept. 11,
P.O. Box 5227
Seattle, Wash. 98107



\$7

For boat, home, shop, office, art studio, etc.

UTILITY KNIFE

Adjustable two point blade
retracts into handle and
may be locked in many
cutting positions
with set screw
adjusted with
coin.

No.
C2000

1.00



On sale in paint
and hardware stores
or send \$1.00 tool sent postpaid.

**HYDE
TOOLS**

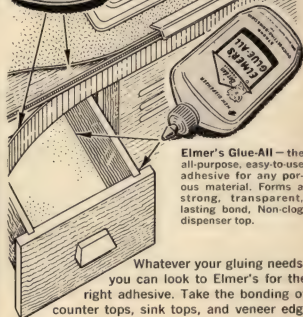
SOUTHBRIDGE, MASS., U.S.A.

Knife with one blade, extra blades five in pak 60¢

WRITE
FOR
FREE
CATALOG

**Elmer's has the right glue
for every job you do**

Elmer's Contact Cement — the ideal adhesive for plastic laminating jobs. Bonds instantly, dries in only 10 minutes under ideal conditions. Comes in jars and tubes too.



Elmer's Glue-All — the all-purpose, easy-to-use adhesive for any porous material. Forms a strong, transparent, lasting bond. Non-clog dispenser top.

Whatever your gluing needs, you can look to Elmer's for the right adhesive. Take the bonding of counter tops, sink tops, and veneer edging — ELMER'S CONTACT CEMENT is perfect. And it's also useful for applying prefinished wallboard to studs and furring, with no need for unsightly nailing. Spreads easily with brush or roller without mixing. For all kinds of cabinetwork and interior construction, ELMER'S GLUE-ALL is rightly called "the best glue in the joint." A favorite of woodworking specialists everywhere. Send a stamped, self-addressed envelope for your FREE copy of "Elmer's Wood-Gluing Handbook." Write: The Borden Chemical Company, 350 Madison Ave., N.Y., N.Y. 10017.



©196

**BORDEN
CHEMICAL**



Ronson introduces the

(Complete with large-

Burns for hours on butane gas. Adjusts from pinpoint to



STARTS LOG FIRES.



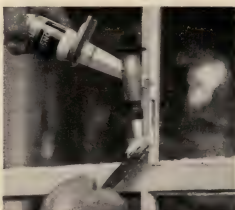
MELTS ICE.



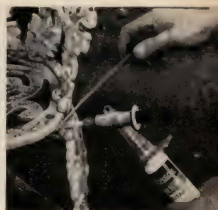
STARTS CHARCOAL FIRES.



REMOVES PAINT.



SOFTENS PUTTY.



FOR HARD-SOLDERING METALS
SUCH AS THIS METAL CHAIR.

O.K. You own a hammer, a chisel, a screwdriver—a lot of good, hardworking tools.

So when something at your house needs fixing, you're ready, willing and able to go to work.

Or are you?

Ever try to thaw a frozen water pipe with that hammer?

Or unstick a cracked floor tile with that screwdriver?

Or chip ice off the front steps with that chisel?

Humiliating, isn't it?

(Not having the right tool at the right time can make you feel about as self-sufficient as an old-maid schoolteacher fixing her first flat tire.)

But now Ronson has a new torch that can do all those

things. And more.

You don't have to be a handyman to put it to work. It starts charcoal and log fires quickly. It burns leaves and caterpillar nests. You can even use it to put a nice brown meringue on Baked Alaska!

It weighs less than 13 ounces. Much smaller than other leading torches, it takes very little storage space. It's as compact and easy to handle as a flashlight.

A blast from this torch can spot-kill a weed faster than you can yell "Crabgrass!"

A broken wire fence needs mending?

This torch can do a perfect soft-solder job in less than a minute.

It can hard-solder a 1/2" copper tube to a brass elbow in just a few minutes.

It can help remove old paint.

Soften old putty.

Fix a kid's toy.

Help refinish furniture.

Sweat copper tubing.

(Whew!)

Loosen rusted pipe fittings and connectors. (Just try to get in and around pipes and fittings with a larger torch.)

Free frozen nuts and bolts.

And even stand up like a laboratory burner.

(This comes in handy when you need both hands free.)

How did Ronson put this new torch together?

We used butane gas, and the

Varaflame Torch. \$4.95.*

size butane Multi-Fill.)

blow torch flame. Lightweight. Compact. Easiest to handle.



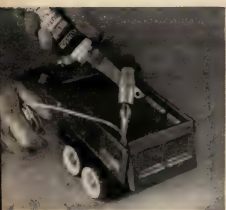
BURNS OUT WEEDS
AND CATERPILLAR TENTS.



FOR LAYING OR PICKING UP
ASPHALT FLOOR TILES.



SWEATS AND THAWS PIPES.



SOFT-SOLDERS BROKEN TOYS.



FOR BENDING GLASS TUBING AND
OTHER LABORATORY USES.



COMES APART EASILY
FOR STORAGE.

same Ronson Multi-Fill® injector that fuels our gas lighters.

(The Multi-Fill injector lasts for hours, but when it runs dry, you can buy a new one almost anywhere in town.)

And we developed an entirely new kind of torch head.

It snaps onto the Multi-Fill injector. You don't have to be a professional plumber to use it.

A fingertip knob controls the flame precisely. You get the bluest flame possible. The steadiest pinpoint flame. (The steadier and bluer the flame, the more intense the heat, the faster the job gets done.)

And you won't have to take this torch apart to clean it between jobs. It's completely self-

cleaning. It just won't clog.

Now.

Where can you get your hands on the new Ronson Varaflame Torch?

Anywhere hardware is sold. The price, complete with large-size, 76 gram Ronson butane Multi-Fill injector, just \$4.95.*

Isn't that a small price for this amazing torch?

RONSON®
Varaflame
Butane Torch



A CAREER WITH A BIG FUTURE



LEARN

AUTOMATION

IBM • BURROUGHS • NCR
FOR MEN AND WOMEN

Prepare now for a good job with high earnings. As more and more companies become automated the need for well-trained people increases. If you qualify, you can train for job opportunities in the career with a future . . . Automation. Metropolitan Schools can train you in your spare time and then help place you in one of these positions. Write or call collect now for full information. Learn at home or in our resident schools. No previous experience necessary.

Educational Loans Available.

- **COMPUTER PROGRAMMING** •
 - **DATA PROCESSING** •
 - **OPERATIONS MANAGER** •
- **BOOKKEEPING MACHINES** •
- **KEYPUNCH OPERATION** •
- **CONSOLE OPERATION** •

RESIDENT SCHOOLS IN MAJOR CITIES

WRITE or CALL
ANY OF THE
FOLLOWING
NUMBERS.
COLLECT

ST. LOUIS
(Area Code 314)
OLIVE 2-5454

MILWAUKEE
(Area Code 414)
276-6860

INDIANAPOLIS
(Area Code 317)
MEIrose 6-1501

METROPOLITAN SCHOOLS

508 N. Grand • St. Louis, Mo. 63103

Please send me full information
and a FREE qualification chart.

NAME

ADDRESS

CITY

STATE AGE

Note to Employers: Please address all
employment requests in care of "Placement
Department".

QUESTIONS ANSWERED

HOMEOWNERS' BY W. CLYDE LAMMEY CLINIC

Chilly Ankles

Our TV room is on the lower level of our bi-level home and the concrete floor is tiled. In cold weather we feel drafts just above the floor level. We've been told that the only cure for this is to lay down a good thick carpet. This would be quite an investment. Isn't there any other way around this problem?—R.F., Me.

Except in homes having a radiant-heat system built into the floors, any carpeted floor will be warmer than a bare floor. But those ankle-height drafts suggest yours is a forced-air system with cold-air intakes in the room in question. If these are located at or near the baseboard level they will act to draw cold air across the floor, creating drafts. This will be especially noticeable when the furnace fan is on. If this is the problem, carpeting would do nothing to correct it. Installing adjustable louvered vents in the cold-air intakes might lessen the drafts. But I would suggest you call in a heating contractor on this one.

Water Heater Worrier

My new water heater appears to have an overflow pipe but I don't see anything on it that looks like a safety valve to keep the tank from blowing up if the thermostat should get stuck and fail to shut off the burner. Do these newer water heaters have some other type of safety gadget for this purpose?—O.S., Mont.

A booklet describing installation, maintenance and operation should have arrived with your new water heater. If it didn't, request one from the manufacturer. The booklet will show that the heater is fitted with a fusible plug, usually installed at or near the top end of the overflow. This plug serves the same purpose as a safety valve. It fuses at a preset temperature and releases any dangerous pressure build-up. In addition, most heaters have one or two blowout plugs which pressure would force from the side of the tank should the fusible plug for any reason fail. Happily, water heaters which are being manufactured today are far safer than those of yesterday and, of course, do a much more efficient heating job.

92,000 CANDLEPOWER

as low as \$6.95 ea. ppd.



American Made
Beware of Imitations

UNDERWATER BEAM LIGHTS

Used by skin divers, hunters, fishermen, shippers, watchmen. "Too bright to read by," says one enthusiast. Special die-casting process gives reflector the most distance, greatest brilliance of any flashlight made.

TREMENDOUS PIERCING BEAM ON LAND—CUTS thru FOG & SMOKE

Made to pierce murky depths and withstand pressures of underwater operation. On land its beam leaps out for twenty miles. 72,000 candlepower illuminates objects clearly a mile away. Pierces smoke-filled areas. Stands alone on special foot. Floods in water. Unbreakable lens. You can jump on this flashlight.

1 at \$10.95 2 at \$9.95 ea. All Prices
3 at \$8.95 ea. 6 at \$6.95 ea. Postpaid



Recharge
without
removing
batteries!

New RECHARGER—Made for Beamlight

Just unscrew head, screw on recharger, and plug into 110 volt outlet. Bring up to full charge up to 50 times! The most effective charger made. Charge any D cells in your beam light!

COUNTRY CLUB BEAM
340 Manufacturers Exchange
Kansas City 5K, Mo.

☐ \$7.95
☐ \$5.95 with beam light

STOP! AUTOMATIC TRANSMISSION TROUBLES TRANS-MEDIC



- ELIMINATES SLIPPAGE
- SMOOTHS ROUGH SHIFTING
- CURES SLUGGISH ACTION

AT SERVICE STATIONS AND AUTO SUPPLY STORES

IDEAL CHRISTMAS GIFT FOR ANY MAN

BEST LOW COST ELECTRIC WELDER MONEY CAN BUY ONLY \$14.95



SEND ONLY \$2.00

You Get: FULL FACE SHIELD, heavy metal cabinet, ground clamp, 12 ft. of heavy duty welding cable, twin carbon arc torch, rod holder, carbons, flux, solder, instructions. SEND ONLY \$2.00. Pay \$12.95 plus C.O.D. charge on delivery or send only \$14.95 and we will ship prepaid. Order today.

5-YEAR GUARANTEE
10-DAY MONEY BACK
TRIAL. WELDS, BRAZES,
SOLDERS, CUTS
ANYTHING OF METAL

No comparison for performance and value. No experience needed to make or repair auto bodies, fenders, trailers, boats, furniture, farm equipment, garden tools, anything of metal. Use up to 1/8-in. welding rods and 1/4-in. carbons on up to 1/4-in. metal. Operates on any 110 V. line. **WORLD'S GREATEST WELDING VALUE.** Over 500,000 in use by home owners, farmers, hobbyists, mechanics. 5-Year unconditional guarantee. Order on 10-day moneyback trial, if not satisfied return for refund. LITERATURE FREE

FOUR-WAY WELDER CO.

DEPT. W2-M, 1810 S. FEDERAL ST., CHICAGO 60616

NOV. 1965



All-Purpose STAPLE GUN TACKERS

HEAVY
DUTY



Model T-50
ONLY
\$12.50
OTHER MODELS
FROM \$4.95

TAKES 6 STAPLE
SIZES: 1/4", 5/16",
3/8", 1/2", 9/16"
and CEILITILE

SHOOT A STAPLE WHEREVER YOU'D DRIVE A NAIL!

FASTER! CHEAPER! BETTER!

for 1001 Home Improvement Fastening Jobs:
Ceiling Tile, Insulating, Upholstering, Screening, etc.



UPHOLSTERING



CEILING TILE



INSULATING

Available at hardware, lumber, building supply,
stationery and other retail outlets.

ARROW FASTENER CO., INC.

One Junius Street • Brooklyn 12, N. Y.

Hot News in Home Heaters

(Continued from page 113)

vents require a wall opening from 6 to 10 in. in diameter. On the outside, the vent juts from the wall about 6 in. and is about as wide as a salad plate.

Room-size heaters are produced as baseboard, vertical or wall-hung units. Some radiate heat, others move warm air, and at least one heats hot water piping along the baseboard.

You can now make your oil-fired furnace up to 25 per cent more efficient with a remarkably lightweight new combustion chamber liner of ceramic fibers. It's the same material used to cushion heat that builds up the outside of a Gemini capsule.

Hot Water—Hot Air

For further proof that maybe the old oil system still has some fire in the furnace, here's an inspired application:

In Peekskill, N.Y., 150 new split-level homes are getting hot water baseboard heat over the concrete slab on the lower level, and forced warm-air heat in the upper levels. The houses are airconditioned in summer. Here's how it works:

A normal, oil-fired hot water boiler delivers heat to the lower-level convectors,

and pipes additional hot water to a set of vertical coils installed in front of the air-conditioning fan. Air crosses the coils, heats up, and is sent through ducts to the upper level. In summer, the boiler line is shut off, and a standard condenser turned on. Cool air flows into the upper level; drops naturally to the lower level.

Despite the ingenuity and efficiency of these existing oil systems, the trend in modern heating is toward gas and electric, and occasionally you can have both.

There is a room-size combination heating and cooling unit that is ideal for an addition on a home. The airconditioning operates electrically, and the heat is fueled by gas. There's one that looks exactly like a window airconditioner. In fact, it will fit through a window, or through the wall, whichever is most convenient.

The very latest twist in electric boilers looks like an ordinary drapery valance. Electrically-heated hot water piping in-

You won't find all the products mentioned here inventoried at your local heating dealer's shop. But if you're really interested in one of them, a letter to the manufacturer will get action. For names and addresses see Page 238.



side the unit sends currents of convected warm air into the room, and frees every square foot of floor space. The same piping delivers cool air in summer.

Electric vinyl sheet is used in a radiant heating system that rolls on the ceiling like wallpaper. Wires are woven into a nylon net which is pressed between two thin layers of vinyl.

The future of heating is even more revolutionary.

In Minneapolis a factory has installed the first heating system that has no pipes, ducts or radiators. No matter how cold it gets outside the workers keep warm with the windows open.

Called a direct-fire heating system, it has a huge furnace on the roof that is essentially a giant blowtorch blazing away in a constant airstream sucked in by fans. The heated air is then pumped through the ceiling into the factory. Since 30 thousand cubic feet of air is pumped in every minute, the building is kept under constant pressure. Air escapes through cracks around windows and doors, and the constant pressure eliminates drafts from outside. The especially unique feature is that if any plant worker is chilly, he reaches over and opens the window nearest him. Hot air inside the building rushes for the

window and warms up his area.

Another heating innovation that will probably never move into the home, but is a natural for offices, factories, stores and schools, is heating from light.

Through a series of eye-wide vents in the overhead fluorescent light fixtures, heated air around the lights is drawn into ducts along with heat escaping from people in the building (about 200 B.T.U./person/hour), heat generated by sunlight streaming through windows, and heat from such things as business machines. This air is collected, sent through a heat exchanger that takes out excess heat, boosted by fans and delivered to areas in the building that need heat. The system does contain a heating element that flips on when the temperature outside is too cold for the cycle to operate efficiently. In summer, the heat exchanger pumps excess heat to the outside, and ducts deliver cooled air.

The gas industry's answer to heat from light is called "total energy." The concept is simple. All energy, including electricity, is produced by a single fuel—gas.

The gas drives either an engine or turbine, which turns out normal 60-cycle power, and can produce 420-cycle or 820-cycle power for bigger jobs. Heat ex-

(Please turn to page 238)

These Weldwood® products make your home more weatherproof than Noah's ark.

1. P.A.R.®, a penetrating water repellent exterior stain that cannot blister, peel, crack or craze. Perfect for shakes and siding. Clear or a variety of colors.
2. Patioliife®, the satin redwood-tone sealer-finish for porch and patio furniture. Guards against chalky rub-off, warping, swelling, cracking or discoloration.
3. Woodlife®, the original water repellent preservative for wood. Penetrates and protects fences, outdoor furniture, siding against moisture, rot, insects and decay. An ideal base for paint. In clear or green for marine use.
4. Rainchek®, for brick, stone, masonry and asbestos. It is completely clear, colorless and odorless when dry. It repels water, and resists age, acids, salt air, direct sunlight and heat.



Only United States Plywood makes Weldwood® preservatives.

UNITED STATES PLYWOOD, 777 Third Avenue, New York, N.Y. 10017



Now...a motor that FOLDS!

The perfect Christmas gift!

Evinrude's new 3-foot, 3 hp Lightwin folds and fits in a 2-foot carrying case. Goes anywhere (with weedless drive). Stows anywhere — car trunk, closet or camper trailer. Handiest fishing motor ever made. See it now at your Evinrude dealer. He's listed in the Yellow Pages under "Outboard Motors." FREE CATALOG. Send the coupon now for your free copy of Evinrude's new 1966 catalog of motors, boats and Skeeter snow vehicles.

EVINRUDE

first in  outboards
Division of Outboard Marine Corp.

EVINRUDE MOTORS, 4186 N. 27th St., Milwaukee, Wis. 53218
Send free Evinrude Motor and Boat Catalog for 1966 to:

Name.....
Address.....
City.....State.....Zip Code.....

Hot News in Home Heaters

(Continued from page 236)

hausted from the engine or turbine is captured and used for general heating, cooling (through an absorption chiller), and heating domestic hot water; making it economical. And since the gas flow is continuous, power is never interrupted by severe electrical storms or heavy snows.

When you look into what is lukewarm in the heating industry—in the research labs and on the drawing boards—you're moving onto exotic terrain. They're working on a gas-heated radiant wall, a forced-warm-air gas furnace smaller than a foot locker; better ways to capture solar heat (page 91, Feb. '65 PM); plug-in gas heaters and appliances; a gas-driven fuel cell that will produce electricity right in your home.

And the young heating design engineer stares wistfully into space and talks about a plutonium cell no bigger than a transistor radio that is planted in a lead well. It heats, cools and electrifies the home for ten years without changing.

But will it really be as much fun as the bundling board?

Manufacturers' Directory

BOILERS, ELECTRIC

Hydrotherm, Inc., Northvale, N.J.
Precision Parts Corp., 400 N. 1st St., Nashville, Tenn. (drapery-valance unit)
Edwards Engineering Corp., 101 Alexander Ave., Pompton Plains, N.J.
W. L. Jackson Mfg. Co., P.O. Box 190, Chattanooga, Tenn.
Siebring Mfg. Co., George, Iowa
International Oil Burner Co., 3800 Park Ave., St. Louis, Mo. 63110
Heat-Timer Corp., 657 Broadway, New York, N.Y.

HEATING-COOLING, RESISTANCE COIL FURNACES

Mathes Air Conditioning Co., 6210 Denton Dr., Dallas, Tex.

HEATERS, SEALED COMBUSTION CHAMBER, GAS

Locke Stove Co., 114 W. 11th St., Kansas City 5, Mo.
Suburban Appliance Co., Dayton, Tenn.
Monogram Industries, Inc., Quincy, Ill.
Temo, Inc., Nashville, Tenn.
Williams Furnace Co., P.O. Box 577, Buena Park, Calif. 90621

Empire Stove Co., Belleville, Ill.
Roberts-Gordon Appliance Corp., 44 Central Ave., Buffalo, N.Y.

Hupp Corp., Perfection Div., Waynesboro, Ga.
Royal, Inc., Judd Rd., Chattanooga, Tenn.

HEATERS, RADIANT

(Ceiling Panels) Minnesota Mining Co., St. Paul, Minn.
(Vinyl Sheets) Goodyear Rubber Products Corp., Akron, Ohio

HEATERS, COMBUSTION CHAMBER LINERS, OIL

Johns-Manville, N.Y., N.Y. (do it yourself)
Babcock & Wilcox, Augusta, Ga.
The Carborundum Co., Niagara Falls, N.Y.
Refractory Products Co., Evanston, Ill.

HEATING, DIRECT-FIRE, GAS

Honeywell, Minneapolis, Minn.

HEATING-COOLING

(Resistance Coil Furnace) Mathes Air Conditioning Co., 6210 Denton Dr., Dallas, Tex.
(Hot-Water and Hot-Cold Air Combination) Fedders Corp., Maspeth, L.I., N.Y.
(Gas, Wall-Window Room Unit) Suburban Appliance Co., Dayton, Tenn.
(Gas, Wall Unit) Temo, Inc., Nashville, Tenn.; Climatrol Div. of Worthington Air Conditioning Co., Milwaukee, Wis.

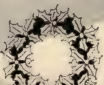
WANT CASH FOR YOUR INVENTION?

One of America's greatest authorities on methods of selling inventions has just completed a new book, "How to Cash in on your Invention". Hundreds of valuable facts for inventors show how to protect inventions, how to offer them to buyers, who to offer them to, what kind of "deal" to make to protect yourself. Now offered on a money back guarantee. Send \$2.00 cash or personal check. Keep the book for 10 days. Money back if you return it. A possibility of a big sale if you keep it.



INVENTORS PRESS Dept. M-A11
520 N. Michigan Avenue • Chicago, Ill., 60611

FOR HOLIDAY DECORATIONS



KRYLON
SPRAY PAINT

IF YOU PRIZE IT... KRYLON-IZE IT

SEND FOR JEWELRY CRAFTS FREE CATALOG

Lapidary—rockhounding—jewelry making... add up to a fascinating creative art!

JEWELRY CRAFTS CATALOG
FREE

BIG SAVINGS NOW
ROCKHOUNDS
UP TO 33% OFF

over 10,000 items from all parts of the world.

MACHINERY—SUPPLIES—ETC.
MOUNTINGS—BOOKS—CRAFT TOOLS
STONES—JEWELRY MATERIALS
GRIEGER'S, INC.

Dept. 34—1633 E. Walnut—Pasadena, Calif.

WORKING WITH WOOD?

FILL HOLES, DENTS AND CRACKS WITH

Makes a smoother job, blends with unfinished wood, no shrinkage.

Wood Patch



Putty Stik
PATENT PENDING

Fills Nail Holes and Blemishes
Save finishing time... apply prefinished paneling... set nails... and putty last. Choice of 35 wood colors.

At Your Dealer, or Write

FIC FOREST INTERIORS CORP.
P.O. Box 1848, SEATTLE, WASH. 98111

Sensational, All Purpose, New 6 in 1 EMCO-STAR

Instant Change-over



6" Band saw
8" Circular Saw
7" Disc Sander
8 1/2" Jig Saw
2" Belt Sander
Saber Saw

Complete shop for home & industry

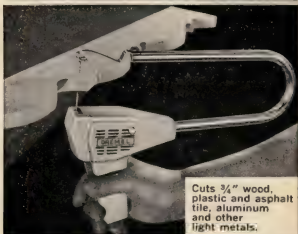
New EMCO-STAR is the fastest change-over machine ever. Switch from band saw to Circular saw, then to sander, instantly.

Check these exclusive EMCO-STAR features:

✓ The only combo-machine that gives you band saw and jig saw as part of the basic unit
✓ Convenient size ✓ Compact enough for portable use
✓ Ball-bearing equipped throughout
✓ Add wood lathe and molder with low cost attachment
✓ Many accessories available
✓ Precision-built by the makers of multi-purpose UNIMAT. Write for catalog: American Edelstaal Inc., Dept. EE-K3, 350 Broadway, N.Y.C. 10013.

\$189
complete

OR
\$33 down
\$14.50
mo.



Cuts 3/4" wood, plastic and asphalt tile, aluminum and other light metals.

NEW DREMEL ELECTRIC SCROLL SAW

You'll find uses for this New Dremel you couldn't accomplish with any other type saw. And it's so safe the whole family can use it. Ideal for making home repairs and improvements... projects like cornices, valances, shelves. Makes fast work of the most intricate scrolls and curves. When laying asphalt, plastic or rubber tile, it easily cuts irregular shapes and curves so difficult to do with hand tools. Unique 4-way blade holder permits cutting in any direction and to center of 19" circle. High speed 60 cycle AC motor produces 7,200 strokes per minute. Foolproof, trouble free. Unbreakable nylon housing.

Model 501 Scroll Saw complete with 6', 3 wire cord and 9 saw blades.....\$12.95

See your Power Tool Dealer or write for literature on complete Dremel line of power tools.

DREMEL MFG. CO., Dept. 75-K, Racine, Wis.
8303



This saw makes you a weekend lumberjack!

(cap is optional)

There's no other saw like this safe, easy-to-use Wright Power Blade Saw. You use it like a hand saw . . . but a lightweight gasoline engine does the work. There's no chain; just a self-lubricated blade smoothly stroking back and forth. You can fell trees, cut firewood, prune, clear brush, and even make smooth chalk-line cuts for carpentry.

The Wright B316 Power Blade Saw is lightweight. It is used by farmers, builders, orchardists, nurserymen, home and estate owners. Any wood you can reach, you can cut with a safe Wright Power Blade Saw. Larger, more powerful Model B520 also available. See them . . . try them out at your Wright Saw Dealer.



THOMAS INDUSTRIES INC.
Wright Saw Division
Dept. PM115, 207 E. Broadway
Louisville, Kentucky 40202

Motorized Humidifier

(Continued from page 179)

plenum. I used this lid to support the float unit I simply ran a length of $\frac{1}{8}$ -in stainless steel welding rod (with the flux coating removed) through a Styrofoam block, far enough to bend the projecting end back in a U and into the block again to lock it in place. The other end of this rod is bent at right angles and inserted through a bracket soldered to the underside of the lid, as shown at the top of page 179.

The switch is fastened over a hole in the lid by means of an L-shaped aluminum bracket, the operating button projecting through the lid to contact the float arm. The attaching bolt that's directly over this button goes through a slot in the bracket, to provide a water-level adjustment.

Note that the front closure plate is notched to fit down over the water pan. Both the drum-axle-to-motor-shaft and vane-adjustment connections require piercing this plate. The location of these three holes can be determined by setting the plate on the pan and marking its rear face. Only after the motor is installed on the closure plate should you trim off the front excess of the drum axle, and drill for the pin that must seat in the coupling slot (see detail on page 177).

The vane shafts have a washer-stop soldered at the front, so they can't be pulled out of their rear supports. Don't drill the various positioning holes in the closure plate until you've attached the adjusting fingers. Even then, take care not to drill these holes all the way through the plate since it would permit too much air leakage.

Trial-assemble the whole unit on your workbench to check clearances. Make sure vanes don't touch the drum, and that the motor turns the drum easily. If you're using a solenoid valve, adjust the switch until it snaps off with the water about an inch deep in the pan.

The humidifier is designed for assembly and disassembly right in the plenum, since the drum will have to be removed for occasional cleaning. The water connection to the nearest pipe is by means of a small clamp-on needle valve and $\frac{1}{4}$ -in. copper tubing—the same size tubing you run from the valve to the water pan.

The relative humidity in your home can now be controlled by proper positioning of the air vanes: the wider they're spread the more hot air will be forced through the wet drum and the higher the humidity will be. You can either judge it by "feel" or measure the humidity with a psychrometer

(Please turn to page 242)

PEEL OFF PAINT with KLEAN-STRIP

- Fast, clean, safe
- No afterwash needed
- Non-flammable
- Refinish immediately



Heavy-Bodied
wash type



Regular
for furniture
work



THE KLEAN-STRIP CO., INC.
MEMPHIS 6, TENNESSEE

ELECTRIC ARC WELDER \$14.95!

MAKE—REPAIR MOST ANYTHING MADE OF METAL!
LIFETIME BURNOUT GUARANTEE—10 day money back trial!
 Works on 110 volt plug in 10 WATTS! WELDS, BRAZES, SOLDERERS, CUTS, MELTS most ALL METALS! BEATS, NOTTENS, LOOSENS, THAWS, BENDS most ANYTHING. COMPLETE READY TO USE WITH face mask, clamps, arc torch, rod holder, cables—and supply of welding, brazing, solder, rods, flux and ARC WELDING INSTRUCTION BOOK—Tells how YOU can use for GARBAGE—HOBBS—FARM—SHOP or FACTORY all 10 ways—NO EXPERIENCE NEEDED! **SEND ONLY \$2.00** (cash, or M.O. and pay postage) \$12.95 plus COD postage or send \$14.95 for PP del. in USA. BEST WELDER FOR THE MONEY IN THE WORLD. FREE EXTRA "Helping" dark goggles of your order from this ad. Sold ONLY by MIDWAY WELDER, Dept. DPM-11, Kearney, Nebraska.



MAN-SIZE! NOT A TOY!

10 & 12 hp, all-gear drive

Mows lawn up to 60" swath... handles tough jobs others can't. Sized for bigger tools, extra leg room. Automotive clutch, transmission, and differential — no belts. Implements for mowing, dozing, gardening, snow. Own the best, at modest cost! Write for catalog.

ECONOMY TRACTOR

1005 K-11 Anoka Avenue
 Waukegan, Wisconsin



Don't put up with bad-tasting water!

SEND FOR FREE 16 PAGE BOOKLET

You can eliminate excess chlorine, sulphur, other bad tastes or odors from home drinking water. Simple. Inexpensive. Write: Cuno Engineering Corporation, Meriden, Conn.

CUNO® AQUA-PURE® filters



Build BEAUTIFUL CLOCKS

Send just 25¢ for 1965 illustrated clock book—the most complete available, describing plans for grandmother, grandfather, wall and shelf clocks easily and inexpensively made with simple tools. Also pictured are a wide selection of finest dials, quality movements, and kits in high-grade cherry, mahogany and walnut.

CRAFT PRODUCTS, Elmhurst, (1) Illinois

Shrinks Hemorrhoids New Way Without Surgery Stops Itch — Relieves Pain

For the first time science has found a new healing substance with the astonishing ability to shrink hemorrhoids and to relieve pain — without surgery.

In case after case, while gently relieving pain, actual reduction (shrinkage) took place.

Most amazing of all—results were so thorough that sufferers made astonishing statements like "Piles have ceased to be a problem!"

The secret is a new healing substance (Bio-Dyne®)—discovery of a world-famous research institute.

This substance is now available in suppository or ointment form under the name Preparation H®. Ask for it at all drug counters.

do-it-yourself WITH DEXION



SLOTTED ANGLE

Low Cost Steel Units in a Jiffy!

Now you can tailor-make steel equipment of your very own design. Just cut and bolt—using an ordinary wrench and hacksaw. Not only is DEXION a time and money-saver, but fun to work with, too!

LOOK WHAT YOU GET!

50 ft. of angle, 75 nuts and bolts and 20 corner plates

\$10.50



There's an application for Dexion wherever you look!
**WORKSHOP • ATTIC • DEN
 GARAGE • BASEMENT • OFFICE**



WRITE TODAY FOR FREE IDEA BOOKLET available at your lumber or hardware dealer



DEXION, INC. Dept. R11
 39-27 59th St., Woodside, N.Y. 11377

Please send me free "Do-It-Yourself Idea Booklet"

Name _____

Address _____

City, State _____

\$130 PROFIT

A RACE DAY WITH \$50
 25 YRS. RESULTS—7 IN 10 WINS

Sensational book reveals secrets of 10 world's greatest professional race investors. 25 yrs. actual results included, showing 7 in 10 plays won and \$130 average race day profit with \$50. Genuine copyright book supplied only by publishers. Wins at all tracks, horses, harness, dogs. Cut out this ad and send with name and address, for fascinating free brochure:

HITCHINGS, Box 5735-PM-F, Carmel, Calif.
 Cut out and send this ad NOW for bonanza offer

If you want to STOP SMOKING here's how!



by Whitey Ford

The famous Major League pitcher who holds the most World Series records tells what happened when he decided smoking was not good for his physical fitness.

I talked to my doctor about smoking and he advised me to quit. I did. But it was hard. Then I heard about a little pill called Bantron. I was surprised to find that it helped a lot to keep me from smoking. Now, when I feel like relapsing, I just take Bantron instead.

Bantron was discovered by doctors in the research department of a great American University. Tests on hundreds of people showed that it helped more than 4 out of 5 of all people who wanted to stop smoking to do so in five to seven days. Even those who didn't stop completely had drastically cut down.

And the Bantron way is so easy and pleasant! Bantron does not affect your taste, is not habit forming. It acts as a substitute for the nicotine in your system, and curbs your desire for tobacco.

Try Bantron. You will be amazed at the results you get. It's so safe when taken as directed, that you can get it at all drug stores without a prescription.

Bantron
BRAND
Smoking Deterrent Tablets

Make ANY LENGTH Work Bench

STEEL WORK BENCH

LEGS

Industrial quality!

\$13.95 per pair of double legs

FREE

WORK BENCH PLANS



Now, make your own heavy-duty, rigid, home work bench, hobby or leather-stamping bench, power tool stand, etc. Each super-strong PRIDE-CRAFT double-leg 20½" deep by 32¼" high, weighs 14 pounds. Prepaid in Continental U.S.A. Send check or money order to C. F. Warren Co., 6939 N. Hiawatha, Chicago, Ill. 60631



Motorized Humidifier

(Continued from page 240)

(between 30 and 40 percent is the ideal for most homes). Since the furnace blower runs oftener in cold weather when more moisture is needed, the unit tends to maintain a fairly consistent relative humidity, once adjusted. For fully automatic control, add a humidistat which works like a thermostat to turn the unit on only when it's needed. You can buy one for under \$10.

The amount of maintenance will depend on the mineral content of the water you use. I supply softened well water to my unit; since it contains a fairly high concentration of sodium carbonate, a white sludge forms in the pan that has to be removed monthly. When water has a low solids content, you'll have to clean pan and drum only once or twice each heating season.

When the system is connected with a domestic water softener, be sure to shut the unit off during the regenerating cycle or a brine solution will be carried into the pan which could cause corrosion. ★★

Win This Chassis

(Continued from page 89)

relation to its value. Obviously a Suburba-Car should cost less than a ready-made, full-size family car or sports car.

★ Don't forget to write your name and address plainly on every sheet of paper you submit, and tape it to your model, if you decide to submit one.

Entries will be judged by a panel of experts including William L. Mitchell, vice-president, styling staff, General Motors Corp.; Gene Borniat, vice-president and director of styling for Ford Motor Co.; Franklyn Jacoby, ASID/IDI, PM's design consultant; and Wayne C. Leckey, managing editor of PM's Shop and Crafts. The decision of the judges will be final, and professional designers, as well as *Popular Mechanics* employees and their families, are not eligible to compete. Contest is void in states where prohibited or restricted by law. All federal, state and local laws apply. All entries become the property of *Popular Mechanics*, and only one prize is to be awarded.

The winner of the Suburba-Car contest will be announced in our March issue, with a sketch of the prize design. For nonwinners who want to build the chassis for themselves, complete plans will begin in our April issue.

Good luck! By spring you may be driving a handsome new short-tripper that you designed! ★★

Sub-minis—Mighty Midgets

(Continued from page 124)

sinon. This camera is priced at \$149.50.

From PM's submini shooting spree several conclusions may be drawn. First and foremost, picture-taking with tiny cameras is fun—a lot more fun than using conventional size cameras. Most of the midgets are light enough so that they are no more trouble to carry than a pen.

How sharp are submini pictures? Judging from our shots, most of the midgets can make negatives that may be blown up to 8 x 10's of thoroughly acceptable quality. Cameras such as the Rollei 16 and Tessina can turn out work comparable to that of all but the best 35-mm cameras.

It's not really fair to compare submini picture quality with shots taken on 35-mm or 120 film. The midgets are not intended to replace larger cameras. Their greatest virtue is portability; you can always have a submini stuck away in your pocket, ready for a fast draw when an unexpected picture opportunity presents itself. Never again will you have to say, "If only I had my camera with me."

Of all the cameras tested, the Minolta 16 II seemed to offer the most for the money: drop-in film loading, an amazingly sharp lens, and full adjustment of shutter speeds and aperture. The Minox, easiest to carry of all the submini's, is so light that it's difficult to hold steady even at normal shutter speeds. Its tiny negative demands the most careful processing. The Tessina takes getting used to. It's hair-trigger shutter release is easy to trip unintentionally. The motorized film advance does not offer any practical advantage. On the other hand, the lens is top notch and the cartridges can be reloaded with standard 35-mm film. The Edixa 16 has a fine lens and an efficient rapid-wind lever but hangs heavier in the pocket than some of the other submini cameras. The Rollei 16 is an easy camera to load and use. It's workmanship and optical quality are superb. A fine camera for the snapshooter is the Yashica 16 EE with its electric eye and fixed focus lens.

Before you buy any submini, check on the local availability of film. The Minolta and Yashica use the same cartridge. The others require special loads that may not be available from your dealer.

On that exciting day when you're ready to shoot your first roll of submini pictures, remember to dust the inside of a camera before loading, gently squeeze the shutter release to prevent camera shake, move in close to the subject to fill the entire negative area, and expose accurately. That's all there is to it. ★★



**GRINDS
DRILLS
CARVES**

**POLISHES
SHARPENS
DEBURRS**

No. 2
Moto-Tool Kit
Illustrated

MOTO-TOOL

THE POCKET SIZE MACHINE SHOP

Handiest tool you'll ever own. Does fine detail work with pin point accuracy. Eliminates time consuming hand work. Gets into places difficult to reach with larger tools. 27,000 RPM. Collet sizes 1/8", 3/32" and 1/16". An industrial favorite since 1936. Wt. 13 oz.

NO. 2 MOTO-TOOL only . . . \$19.95

NO. 2 MOTO-TOOL KIT with 23 accessories in steel case . . . \$29.95

NEW HEAVY DUTY NO. 3 MOTO-TOOL

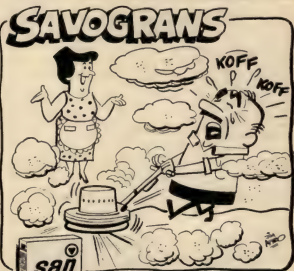
New high torque motor designed for hard industrial use. Same features as No. 2 plus 50% increase in power.

NO. 3 MOTO-TOOL only in steel case . . . \$29.95

NO. 3 MOTO-TOOL, 23 accessories, steel case . . . \$37.95

SEE YOUR DEALER OR WRITE FOR CATALOG

Dremel Mfg. Co. • Dept. 115-K • Racine, Wis.



"THERE'S A BETTER WAY DEAR,
THE SAVOGRAN WAY... WITH
SAN MOP ON, MOP OFF!"

IT IS . . . a perfect heavy duty cleaner that makes wood floors and stairs look like new.

IT DOES . . . take off old varnish, shellac from wood floors without costly machine sanding. No harmful fumes . . . no fire danger . . . non-caustic or acid. Just mop on . . . mop up . . . refinish

"Where Paint is Sold"



SAVOGRAN

Addison, Ill.

NORWOOD, MASS.

Los Angeles, Cal.

EDGE TREATMENTS



1. STOCK VINYL, RUBBER OR ALUMINUM EXTRUSIONS



2. HALF ROUND NAILED TO BOTH SIDE OF PLYFOAM, I.D. PLASTIC HOSE SLIT GLUED & NAILED OVER EDGE



3. WOOD MOULDINGS NAILED & GLUED IN PLACE



4. PLYFOAM CAP RAIL TACKED & GLUED IN PLACE. COVER WITH GLASS TAPE



5. ROUND PLYFOAM EDGE TO 3/16" RADIUS & COVER WITH GLASS TAPE

(Continued from page 150)

glue and toothpicks to assemble the strips.

To produce a large compound curve from a single sheet, however, you'll probably have to heat the whole sheet at one time. Where Plyfoam is used in manufacturing operations, a large industrial heating blanket takes care of this. Since such blankets are too expensive for general use, *PM* has designed a simple, low-cost oven which accomplishes the same thing. It's detailed on page 150.

Once the sheet becomes pliable, it must be quickly transferred to the form and anchored in position. A heat lamp used as a supplementary local heat source will help to prevent too-rapid cooling and allow more time for manipulation. It will also come in handy for spot-heating when putting the finishing touches on the shape.

When producing a deep, domed shape from a single sheet of Plyfoam, some surplus material undoubtedly will wrinkle around the edges, just as would a thick piece of felt. Trim off this surplus with a sharp knife. As with any other Plyfoam joint or surface, a few inaccuracies won't matter since the whole thing will be hidden under fiberglass. Cut filler pieces to plug any gaps left by your trimming and glue them in place.

The result of patching up in this way is exactly the same as a continuous sheet in the finished project, so don't worry. And as this implies, every scrap of material can be used up by piecing small projects together, trimming as you go.

When assembling a Plyfoam structure, keep in mind that it will be necessary to have access to *both* sides of the material in order to apply the fiberglass reinforcing layers. Thus, it's often desirable to plan



FLAT BUTT JOINT fastened with adhesive and reinforced with toothpick push pins is even stronger than foam, can be used without weakening structure



ALTERNATE METHOD of securing butt joint while the adhesive cures is to locate it over building frame member and temporarily wire it to the frame itself

your project as two or more subassemblies which can be joined together after each has been fiberglassed.

Fiberglassing Plyfoam. Be sure to follow all the standard safety precautions when covering your Plyfoam project with fiberglass. Work in a well-ventilated area maintained at a comfortably warm temperature (about 75° F.).

Wear rubber or plastic gloves when handling the wet resin. Avoid prolonged contact between wet resin and skin. Wash thoroughly and frequently.

The first step is to spread the fiberglass cloth flat over the shaped Plyfoam and mark it for cutting. For most projects, 10-oz. cloth is recommended. During this preliminary fitting, make sure that joints in the cloth won't coincide with joints in the foam.

Cut all the cloth required at one time so as to avoid delays once the resin has been mixed. Leave between 2 and 4 in. excess at joint edges and about an inch for final trimming to size.

It's extremely important that you follow the manufacturer's instructions when mixing the resin. Measure quantities carefully and *mix well*. Don't prepare the resin until you're ready to go to work, however, for once mixed it will remain in a liquid state for only a limited time. Just how long depends on the type of resin, but an hour is the common period of time. Mix only as much resin as you can conveniently use during this period.

Instead of painting your project, you may wish to add coloring to the resin itself. Special color pastes for use with epoxy are available from most dealers handling resins.

(Please turn to page 246)



FILLET OF FOAM reinforcing right-angle butt joint should be taped with glass so load is effectively transmitted from skin of one panel to the other

ask?



it's
worth
asking
for.

(good things usually are)



(Continued from page 245)

Epoxy is the recommended resin for use with Plyfoam; polyester may be used after a prime coat of polyurethane varnish.

With a wide paintbrush, spread the resin evenly over the exterior surfaces of the project. Then lay the glass in the resin and smooth it out. Use a rubber or plastic squeegee to work trapped air to the edges of the glass cloth.

Put enough pressure on the squeegee to work the resin through the fabric, thoroughly saturating the cloth. Remove any excess resin. The finished appearance should show fibers of cloth evenly wetted with resin over the whole surface. If "dry" spots persist, work a little resin into them with the brush and squeegee.

Finish off the outside of the project in this manner, adding reinforcing strips of cloth along all angle joints. The joints between pieces of cloth may either butt squarely or overlap slightly.

As soon as possible, remove the project from the frame and cover all inside surfaces. This will eliminate the possibility of warping which might arise due to one layer curing without the stiffening effect of the second layer. With a layer of glass on both sides no warping will occur.

On larger structures requiring even greater rigidity, apply two layers of glass to each side. Such a sandwich will be strong enough for practically any project; 40-ft. sailboats have been built from 1/2-in. Plyfoam with just two layers of 10-oz. glass on each side.

While the glass cloth texture makes a satisfactory and pleasing finish, you may wish to have a smooth surface. If so, fill the surface with epoxy or polyester filler and sand it down; paint with an epoxy or polyester paint and polish when dry.

On projects involving flat surfaces or simple curves, unusual effects can be achieved by substituting other rigid sheet materials for glass on one side of the Plyfoam. Embossed aluminum and Formica are two obvious choices.

Again, with flat surfaces or simple

(Please turn to page 248)

MAKE \$30 TO

Some make more, some less

MAKE BIG MONEY • With an easily operated, highly efficient WALL WASHER, H.D. Hart makes \$30 to \$100 every day he works. E. Goss took in more than \$10,000 in one year. C.H. Jones wrote, "I made a net profit of \$1200 on one job." And no wonder — this machine washes walls 6 times faster and better than by hand and with no mess — no drop cloths needed.

Your Money-Making Opportunity • We want more men to go into this profitable business for them-



\$100 A DAY

We help you to start your own all-year business

selfes and enjoy independence — freedom from layoffs and bosses.

Customers everywhere — homes, offices, schools, churches, hotels, etc. How much you earn depends largely on you, but we help you to start and work with you for your success. Training and consulting with experts is available at no additional cost. What you take in is mostly profit. No need to rent shop or office; operate from home. Can start spare-time until full time is justified.

Ours is NOT a lease arrangement • You are free to operate in an independent manner. You sign no contract. You own the detergent outright and are always your own boss... and every dollar you take in is yours to keep. You pay no fees, or dues, or royalties to anyone, and enough supplies come with it to return far more than your investment. Many earn the cost of the detergent in a week or two. It costs nothing to get details... write TODAY.

FREE BOOK! MAIL COUPON TODAY

VON SCHRADER MFG. CO.
E10 "W" Pl., Racine, Wisconsin

Send at once (no obligation) your **FREE** booklet containing information about your **WALL WASHING MACHINE** and how I can start my own permanent, profitable business.

Name

Address

City State Zip Code

Lose No Time — Send Coupon Today for All the Facts

THE PERFECT CHRISTMAS GIFT

NEW DYNAMIC MARK 88
INDUSTRIAL TRANSFORMER ARC WELDER

ANYONE CAN WELD, BRAZE, CUT, SOLDER, HEAT ON STEEL, BRASS, ALUMINUM, AND OTHER METALS.

Build and repair anything of metal. Tremendous time and money saver. **THIS IS ALL BRAND NEW PROFESSIONAL ARC WELDER!** Rugged metal cabinet, baked Hammer-ford finish, ideal for home, shop, farm and industrial use. Expert work on your FIRST job. **POWERFUL** glass insulated transformer welds 1/2" metals with 5/8" rods. 4 heat settings, 20 to 80 amps. Operates on 110 Volt AC house line fused for 30 amps. Complete, ready-to-use—full head shield, electrode holder, ground clamp, cables, solder, assorted rods and simplified welding manual. Double-protection guarantee: 10-day money-back trial plus full 5-year warranty on materials and workmanship. **Order today: ONLY \$47.50 (220V at \$49.50).**



SEND ONLY \$600

Only \$47.50 Complete, Send only \$6.00. Pay balance plus C.O.D. charges on delivery.

EASY PAY PLAN—Write for easy pay plan. LOW down payment—pay as you weld and earn.

Welder Details: FREE

DYNAMIC WELDER CO. DEPT. D2-M
1808 S. FEDERAL ST., CHICAGO, ILL. 60616

AT LAST!

The lathe you've been waiting for
... at a price you can afford!

Only \$69.95!
the METAL MASTER

A precision-built bench lathe with powerful, positive drive... full 4 1/2" swing... all the features of a big lathe. Three models — 9 1/2" to 28 1/2" centers. Accessories never before available in this price range. Companion bench drill. **Send for Free literature**

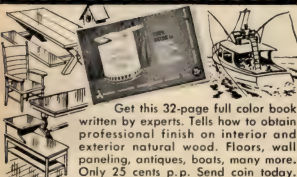
Metal Master Tool Company
Mt. Ephraim, N. J. 08059



GUNK GP
CLEANS
POWER MOWERS
GARAGE FLOORS

BRUSH IT ON
HOSE IT OFF
AT HARDWARE, FARM AND AUTO STORES

HOW TO FINISH WOOD



Get this 32-page full color book written by experts. Tells how to obtain professional finish on interior and exterior natural wood. Floors, wall paneling, antiques, boats, many more. Only 25 cents p.p. Send coin today.

McCLOSKEY VARNISH COMPANY

DEPT. PM11, 7600 STATE RD., PHILADELPHIA 36, PA.
NOV. 1965

Lose 10-15 Lbs. A Month On New Air Force Diet

Often Called The Drinking Man's Diet

WASHINGTON, D. C. (Special)—This is the revolutionary new low carbohydrate diet that everyone is suddenly talking about. It is known variously as the Air Force Diet, the Astronaut's Diet, the Airline Pilot's Diet, and sometimes popularly known as the Drinking Man's Diet. In effect, it allows you to drink all the liquor you want, enjoy formerly "forbidden" foods such as big steaks trimmed with fat, rich gravies, mayonnaise, lobster swimming in butter, bacon, fats, sausages and scrambled eggs—and still lose 10-15 lbs. a month. **This is the one diet that really works.** Senators in Washington, D. C., and Members of Parliament in Ottawa, Canada, report losing 40 to 50 pounds with ease. Women report equally startling results. Calories play no part in this diet. What you do to count your carbohydrate grams, and limit your starch and sugar intake to 60 grams daily. The reason for this is simple. When your body doesn't burn up all starches and sugars you eat, the excess carbohydrates quickly turn into unsightly fat. On a low carbohydrate diet your body is forced to call on its own fat (stored carbohydrates) for energy and thus you lose fat. When the fat is gone you will cease to lose weight, and your weight will remain constant. Counting carbohydrate grams is easy. The new Air Force diet manual lists the carbohydrate content of over 1,500 foods and 50 alcoholic beverages. And gives the detailed rules to follow this new diet. It also gives typical low-gram menus that are every bit as pleasant as not dieting at all. The new Air Force diet manual was primarily designed for Air Force personnel to keep in fighting trim. But it has proven to be more than that. It has proven to be a Godsend for people who hate dieting—who find salad without dressing unbearable, eggs without bacon unthinkable, dinner without martinis uncivilized. In short, if you like to live well and have a weight problem, this new diet manual will change your life, as it has for thousands of others. Recently published as a private edition in Canada, the diet manual can now be obtained by sending \$2 to AIR FORCE DIET, Room 104, 92 King Street East, Toronto 1, Canada. Unconditional money back guarantee. If after trying the diet for 30 days you have not lost 10-15 lbs., simply return the diet manual and your \$2 (plus postage) will be refunded promptly and without argument. Tear out this message as a reminder. Decide now to regain the trim attractive figure of your youth—while still enjoying hearty breakfasts, lunches and dinners—and drinking all the liquor you want. Order now before others snap up the limited supply.

DIRECT FROM SOURCE—BELOW WHOLESALE!



\$999
ONLY

'65 FORD OR DODGE

'64 DODGE **\$699**

'64 FORD **\$699**

'64 STUDEBAKER **\$999**

Formerly taxis, carefully maintained by Fleet Owners.
No taxi signs or markings.

No different than regular passenger cars.

FREE! GET THE EXCITING FACTS NOW!
WRITE FOR ILLUSTRATED CATALOG
AND ACTUAL PHOTOS TODAY!

Bank reference: TRUST COMPANY OF NEW JERSEY,
457 West Side Ave., Jersey City, N. J. 07304.

CALL, WIRE, WRITE LARRY SHANDEL

Phone: Area Code 201 866-7500—N.Y.C.: 212 244-1580

UNIVERSAL AUTO WHOLESALE INC. Est. 1956

235-A Penhrow Ave., Secaucus, N. J. 07094

Only 10 minutes from N.Y. off U.S. 1 & 9



(Continued from page 246)

curves it's possible to produce custom decorative panels by borrowing some of the standard techniques of fiberglass molding.

A Formica surface can serve as the mold. Apply a layer of wax "parting coat" (you can buy this from any fiberglass supply house) and spray or brush a layer of clear resin over the wax. Lay a patterned fabric on the resin, pattern down, and over this lay a layer of glass fabric saturated with resin. Apply another layer

of resin, then the Plyfoam, and finish with a final layer of resin and glass fabric.

Once everything has dried, remove the Formica mold and you'll find a high-gloss clear finish protecting the patterned fabric.

Alternatively, this process may be used to produce a high-gloss colored surface by using colored resin.

To attach fittings, handles and hinges to a Plyfoam project you may either add wood inserts in the Plyfoam core before fiberglassing or drill holes in the finished laminate and install fiber or plastic screw anchors with adhesive.

Load-bearing attachments can be glassed into position and reinforced by applying

Boat Building (Continued from page 155)

The Sea Shell pram can be put together without heating the Plyfoam. You simply pin the pieces together around the frame with annular-ring nails (which are included) and cover the hull with fiberglass. Complete plans and building instructions are included with the kit. In general, how-

ever, the construction procedure follows that outlined earlier for making any Plyfoam project.

Samples available. If you would like to obtain samples of Plyfoam to experiment with in your shop, send 25 cents to Popular Mechanics Bureau of Information, 575 Lex-



TOUCHE III, John Potter's big trimaran, was the first boat to be built of Plyfoam. The cat-rigged boat carries 650 sq. ft. of sail on a 51-ft. mast



15½-FT. TYPHOON runabout from McNair Boat Works sells for \$749.95 in kit form. Except for a wooden deck and transom, it's made entirely of Plyfoam



10-FT. TUNNEL HULL is a research prototype from Plyfoam, Inc. Unsinkable, it contains enough flotation to keep five people afloat, even when holed

successive strips of fiberglass at different angles.

A wide variety of edge treatments is possible. For a square edge, cut back the Plyfoam and fill the edge with epoxy or polyester filling compound of putty consistency. Sand the edge smooth and paint it. For a rounded edge, just file the edge round and cover it with fiberglass tape.

Capping strips can be mounted with epoxy adhesive, or you can make up Plyfoam "nosing" and fiberglass over it.

Don't be afraid to let yourself go when working with Plyfoam. It has tremendous potential and the main need for taking full advantage of its possibilities is a generous helping of imagination. ★★★

ington Ave., New York, N.Y. 10022. You'll receive two small strips of foam—one uncoated so you can try out its thermoplastic characteristics and the other sandwiched between two layers of fiberglass to give you some idea of the strength the material offers for project use. ★★★



LIGHTWEIGHT PRAM is another Plyfoam prototype. Both pram and tunnel hull may eventually be offered to the public, possibly as mail-order kit boats

You get 2 tools in 1 in the New **RIGID RAPRENCH** DUAL PURPOSE

(Pipe Wrench and Hammer)



Available in
10" size only!

**EXTRA HANDY
IN EVERY TOOL BOX
AS A WRENCH
AND A HAMMER!**

A special housing design makes this new 10" **RIGID** Raprench an extra-handly, "two-use" tool. As a wrench, it offers all the same outstanding qualities found in our regular **RIGID** Heavy-Duty wrenches. The housing, however, is deeper and broader to create a strong, smooth, striking surface. It's this broad, flat surface, plus added head weight, that make this new **RIGID** Raprench ideal for occasional hammering use.

See and buy this new
RIGID RAPRENCH
at your Dealers.

RIGID

THE RIDGE TOOL COMPANY, ELYRIA, OHIO, U. S. A.

FABULOUS WORK CLOTHES OFFER!

2 COMPLETE OUTFITS



2 SHIRTS & 2 PR. PANTS

ONLY \$3.39

It's the greatest work clothes bargain ever offered! 2 shirts & 2 pairs of pants... all 4 for only \$3.39 complete! Made of fine, long-wearing fabrics, completely washed, sterilized & reconditioned for sturdy, durable service! Practically every size in-stock for immediate delivery. **SATISFACTION GUARANTEED**... try them for 10 days and if you're not completely satisfied, return for immediate refund!

FAIRTEX FABRICS, 817 Broadway • N. Y. C.

Enclosed is \$1.00 deposit. Send 2 work clothes bargains! I'll pay postage C.O.D. balance plus postage.

COLLAR SIZE _____ WAIST SIZE _____ PANTS INSEAM _____

(Please Print) _____

Indicate 1st & 2nd Color Choice: ☐ BLUE ☐ TAN ☐ GREY ☐ GREEN

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

8 times more power to relieve pain of **HEMORRHOIDS!**

Soothing Nupercainal concentrates on pain!
Prolonged relief of pain, burning and
itching starts in minutes.

If you suffer from the misery of hemorrhoids, remember this about remedies you can buy for temporary relief. The leading "shrinking" preparation contains no anesthetic to relieve pain.

No wonder so many doctors recommend Nupercainal. Soothing Nupercainal relieves pain, itching, burning fast... gives prolonged relief... because it has *over eight times more pain-killing power* than the other most commonly-used topical anesthetic!

Nupercainal quickly puts raw nerve ends to sleep... thus puts pain to sleep. Lets you go about your business... relieved of the stabbing pain, burning and itching torment of hemorrhoids. Get Nupercainal Suppositories today—with free, handy pocket-pack. Start to live again, in comfort! (Ointment also available.)



Psoriasis sufferers regain more normal looking skin!

Whenever scales, redness, and itch of psoriasis occur, don't let them embarrass you—there is new hope. Medically-proven Mazon helps remove crusty scales without painful irritation, relieve itch and soreness fast; fades telltale redness; helps check formation of new scales! Mazon's vanishing cream formula is pleasant to use, disappears as you rub to help you regain smoother, more normal-looking skin. Don't spend \$4 or \$5 for psoriasis relief. Tried, proven Mazon is only \$1.00 at all drugstores, without prescription. Satisfaction guaranteed or money back from Thayer Laboratories.

Deal for the Harried Commuter

(Continued from page 104)

line control. Cars thus can speed along, virtually bumper to bumper, at 50 mph, the projectile into a fanjet-like engine and exhaust it in precisely calculated quantities that would not appreciably disturb the main air mass in the tube. Primary propulsion would be from another engine at the rear of the vehicle, perhaps a bladeless propeller invented by Dr. Foa. The vehicle would be centered in the tube by ground-effect jets.

Because one of the major obstacles of attaining high speeds in other type vehicles—drag from air made turbulent by the act of ramming through it—would be eliminated, great speed could be attained with remarkable little power.

This system has been tested in model form. Now Dr. Foa hopes to build a pilot version in a tube three miles long.

"In fact, from the standpoint of technical feasibility, construction of a system with speeds up to 300 or 500 mph could be undertaken immediately."

Another proposal goes back to the old pneumatic-tube system used years ago in department stores. A capsule is pushed into a vacuum tube and the air pressure behind it literally "whooshes" it to the other end. In the tube train, which runs on rails, the "en route" portion of the tube is evacuated of air while the station areas are at normal atmospheric pressure. A valve is opened allowing the train to enter the tube, and the air pressure behind it accelerates it up to 300 mph. The valve allows just the right amount of air to push the train to its next station.

At about the midway point, with the train now compressing the air in front of it, the air before and behind it are about equalized and the air before it now acts as a brake, slowing it down for its next stop. Acceleration and deceleration valves at the stations, and crossvalves to an adjacent tube, contain or release the air in the tube as necessary.

Meanwhile, out on the highway, a new era is about to embark, that of the automated trip. A harbinger is General Motors' proposed "Autoline," a complete speed and directional control system for vehicles, using remote-control electronic signals. Its main components are the inevitable computer, a control cable beneath the automated highway lane, and sensing devices and servo-mechanisms in automobiles that can actuate their controls. When perfected, Autoline will let drivers "phase" into an automated expressway lane with their cars completely in command of the auto-

(Please turn to page 252)

NOW! WARN OVERDRIVE gives 'Jeeps' more Go!



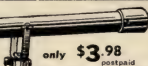
New approved accessory cuts engine RPM 35% at any speed, reduces noise, vibration so you can drive your Jeep 4-w.d., comfortably at freeway speeds. Amazing synchromesh OD lets you shift up or down, on the go, anytime, in any gear, at any speed. Adds six forward speeds, two reverse. At Jeep dealers, or write us.



WARN SALES CO., Inc.
9050-A Empire Way South
Seattle, Washington 98118

300 POWER

Complete Telescope Lens Kit



only \$3.98

postpaid

Conquer Space, Explore the Universe, Planets, Moon craters, New Stars etc. Complete Lens Kit consists of 80 inch focal length ground and polished objective lens, eyepiece lenses for 50 POWER, 100 POWER, 150 POWER, 200 POWER, 250 POWER, 300 POWER, and all necessary lens fittings. Easy to make from simple step by step instructions. (Tripod and mount not included.) Money back guarantee.

BUSSE SALES CO., Hartford, Conn., Dept. PM-86

Swiss saw blades and frames



for intricate, precise and very close detail Operation on metal, wood, plastic, etc.

Saw Frame—5.00—saws—.60 doz., 4.00 gr.

THE RADE CO. IMPORTERS

4574 N. Mobile Ave., Chicago, Ill. 60630.

BUILD FINE

GRANDFATHER CLOCK NOW

CLOCK NOW

Simple, sensible, Red-I-Kut shop tested plans. Build for yourself or sell at a good profit. SAVE 100% S&S. Narrow waist kit! All models "Spirit of the Century" and new "Spirit of Peace" with amazing 22 1/2" front corners or stately straight side "Spirit of America". "HOW TO" Photopack. Plus 122 PATTERNS tell all—plus CLOCK BUYER'S GUIDE. Jet Age heavy brass weight, (Kuepke Original) Westminster, tube-bell chime movements, gorgeous bronze-silver MOVING MOON dials, LYRE pendulums, a solid mahogany Jiffy-joint Kwik-Bilt case kits. \$1.00 each plan. Rush \$2.50 all three plus Free Bonus "Petite Grandmother" plan, as folks have for over 30 years.

Kuepke Chime Works, c/o 24 Kuepke Bldg., Minneapolis, Minn. 55416

TELLS HOW TO SELL YOUR INVENTION

If you have an invention that you believe has merit, write us at once for copy of copyrighted booklet "How to Go About Selling Your Invention." We work with manufacturers, and booklet reveals present markets, qualities of a saleable invention, current royalty rates being paid by manufacturers. Booklet is FREE, is offered to encourage new ideas we might submit to manufacturers. Just send name (no drawings, please) to Kessler Sales Corp., Dept. D-511, Fremont, Ohio 43420



GENUINE ALNICO

MAGNETS

AMAZING. PERMANENT. NON-ELECTRIC. HIGHLY PRACTICAL. Conduct interesting experiments. Hundreds of uses. Retrieve valuable steel items such as guns, tackle from fresh or salt water, tools from tanks and drains. **GUARANTEED.** Try any magnet one week. Money back if you are not well pleased.

M-710 (Wt. 53 oz.) Has pull of 225 lbs. on steel block	 \$18.50
M-625 (Wt. 40 oz.) Has pull of 125 lbs. on steel block	 \$12.50
M-575 (Wt. 18 oz.) Has pull of 75 lbs. on steel block	 7.50
M-500 (Wt. 13 oz.) Has pull of 50 lbs. on steel block	 5.50
M-400 (Wt. 5 oz.) Has pull of 15 lbs. on steel block	 3.50
M-90 (Wt. 3 oz.) Has pull of 12 lbs. on steel block	 3.50
M-47 (Wt. 1 oz.) Has pull of 10 lbs. on steel block	 4.87
M-300 Kit of flat bars—5 pairs (10 magnets)	 5.00
M-400 Kit of magnets, 10 for \$1.00	 10.00
M-35 Science experimenter kit of 8 magnets	 2.00

SEND M.O. OR CHECK—WE PAY POSTAGE—SORRY NO C.O.D.'s
MIAMI MAGNET COMPANY, 3240 N.W. 27th Ave., Miami, Fla. 33142

This cannon went thru 28,792 revolutions ...



(Revolutions on a lathe, that is!)

You can create a museum-like replica of this 17th Century 12 pounder... with UNIMAT, a complete miniature machine shop quite revolutionary itself! Only 16" long, it's a precision lathe capable of completing the most detailed work. Within seconds it demonstrates its amazing versatility. UNIMAT converts into a vertical milling machine, drill press, surface grinder and more—all on one base!



UNIMAT's uses are limited only by the imagination. Make model railroad and slot car racing equipment, electronic components, gas and steam engines, jewelry. Modify guns and rifles. Anything made of metal, plastic and wood.

UNIMAT operates with the accuracy of expensive toolroom equipment (.0005") at just a fraction of the cost. Basic UNIMAT sells for \$139.50 and includes lots of extras. It's so easy to use... takes up so little room. And no experience is necessary.

To find out more about UNIMAT, just drop a card in the mail for free illustrated literature. To discover its complete personality, send \$1.00 for "Miniature Machining Techniques"—a 40 page photo packed manual.

American-Edehstaal, Inc., Dept. E-K5350 Broadway, N.Y.C. 10018.

Live Better Electronically With

LAFAYETTE RADIO ELECTRONICS

512 Pages

FREE!

Now BETTER THAN EVER
1966 Catalog 660



Stereo Hi-Fi • Citizens Band • Ham Gear • Tape Recorders • Test Equipment • TV and Radio Tubes and Parts • Cameras • Auto Accessories • Musical Instruments • Tools • Books

Featuring Everything in Electronics for
• HOME • INDUSTRY • LABORATORY
from the "World's Hi-Fi & Electronics Center"

LAFAYETTE Radio ELECTRONICS
Dept. LK-5 P.O. Box 10
Syosset, L.I., N.Y. 11791

Send me the Free 1966 Lafayette Catalog 660

Name

Address

City State

Zip
(Please Give Your Zip Code No.)

2,000

Wood

CATALOG & MANUAL

Hard-to-find PRODUCTS for easier...better woodworking!

Discover! Enjoy! Benefit from newest products and ideas in Constantine's big picture-packed Manual, Wood headquarters since 1912. Largest selection of world's most beautiful cabinet lumber, veneers, plywood, inlays, moldings. Woods in natural color. Tool bargains. Furr. Hdwe. Finishing & upholstery supplies. Fabulous plan that needs no clamps! Instructions. Everything. Unsurpassed values. Send 25¢ now for your copy. **TEAR OUT A.D.**

ALBERT CONSTANTINE AND SON, INC.
 2050 Eastchester Rd., Bronx N.Y. 10461 Dept. S-5
 Enclosed 25¢ for new Constantine Catalog-Manual

NAME _____
 ADDRESS _____

To Make and Sell Ornamental Concrete Items

You Need MOLDS

For Thorough Info
 On Over 300
 Different Molds
 You Can Buy And
 Use Plus Complete
 Start To Finish
 Professional Instructions

RUSH \$2.00 for book

TURN CONCRETE INTO GOLD

CONCRETE MACHINERY COMPANY, INC.
 839 Lenoir Rd. - P. O. Box 99 - Hickory 2, N. C.

PELLET FIRING
LUGER AUTOMATIC

- MAGAZINE LOADING CLIP
- OVER 15 MOVING PARTS
- FULLY AUTOMATIC

ONLY
\$198

Automatic full size model of a Luger Automatic pistol—contains over 15 moving parts. Loads 8 complete rounds which snap into the hard butt, simulating a Luger. Fires 8 bullet shaped pellets. Has automatic slide action.

MOST AUTHENTIC MODEL GUN WE'VE EVER SEEN
 Comes to you with working parts disassembled with cleverly engineered springs. Full instructions, supply of pellets and targets. Full Money Back Guarantee. Simply send \$1.98 plus 27¢ shipping charge. N.Y. State residents add 4¢ sales tax.

HONOR HOUSE PROD. CORP., Dept. 96LG11, Lynbrook, N.Y.

IF YOU HAVE

HERNIA

Get this NEW FREE BOOK

Tells how Rupture can be treated by a mild Non-Surgical method that is backed by a Life Time Certificate of Assurance. This treatment method has a long history of use and is recognized by Authorities today. Men and Women from all over the country have taken the Non-Surgical Treatment and reported it is effective. Why put up with wearing a griping, chafing, unsanitary truss?

Write today for this FREE BOOK. Tells How, explains Why more and more Rupture Sufferers are using Modern Non-Surgical Treatment Methods. Act Now. No Obligation.

EXCELSIOR MEDICAL CLINIC
 Dept. E6129 Excelsior Springs, Mo.

Deal for the Harried Commuter

(Continued from page 250)

allowing the driver a passenger's freedom while increasing road capacity tenfold.

A variation for motorists is the "Roll-way," a "piggyback" freight technique to carry autos and their passengers on high-speed automated trains. Designed by the General American Transportation Corp., the system would utilize streamlined trains four times the width of a standard-gauge rail line, operating approximately five minutes apart along turnpikes and other major traffic routes. This would enable motorists starting a trip to drive aboard and park parallel to other autos, stroll to a passenger lounge, then, on arrival, resume their trip by auto.

What . . . No Highways?

Some day, in fact, you may even have the option of driving vehicles that require no highways. Ground-effect machines—or Hovercars—which ride on a friction-free cushion of air created by the down-blast of powerful air jets, can go anywhere, even over water, as long as their air cushion is sustained.

In air travel, efforts to design and place in service a supersonic airliner by 1970 are well known. Less familiar, however, is another development of almost equal significance, vertical takeoff and land planes (VTOLS). Some, using jet engines, blow the air down for takeoff and landing, and rearward for forward cruise. Others, using props, tilt the engines or tilt the wings. The most recent, the Bell X-22, uses four ducted props, tilting them up or down for forward or vertical flight. Success of any of them could lead to transports that could carry passengers from downtown areas, bypassing hard-to-get-to airports.

In water travel, the most significant advance since the steamboat has arrived, the hydrofoil liner which lifts from the water and rides on low-friction, airfoil-shaped "legs." Many hydrofoils are now operating in such varied locales as the Rhine River, on Italian and Swiss lakes, the Mediterranean, Baltic and Adriatic Seas, and are carrying passengers between Manhattan and the New York World's Fair. The U.S. Navy and Maritime Administration are experimenting with hydrofoils; one, built by Grumman Aircraft Corp., an 80-ton ocean going craft, and another, built by the Boeing Co., an awkward-appearing test vehicle designed for 115 knots!

All this is only a sampling of changes that lie ahead. Man, while exploring space, is also launching a transportation revolution on earth, one that may be even more far-reaching for most people. ★ ★ ★



**SPEND THE REST
OF YOUR LIFE
ON VELVET**
America's
Smoothest Smoke

Liquid WRENCH

LOOSENS RUSTED NUTS, BOLTS, PARTS IN SECONDS
at Service Stations, Auto and Hardware Stores



BRONZE FOUNDRY

Since 1935

Schools • Home Workshops • Inventors



Make your own castings of aluminum, copper, bronze, silver. Foundry sets are available in six sizes, capacity 1½ lb. to 48 lb. of red brass. 2400 Deg. F. blast furnace included with each. Write for Free Circular.

KANSAS CITY SPECIALTIES CO.

Dept. P-11, P.O. Box 193, Middleton, Wisc.

SAW SHARPENING IS EASY

Super Filer No. 11 joints and sharpens circular saws 6" to 10" with all teeth correct in height, depth, pitch, bevel. When file hits steel roller, teeth are finished. Saw runs true with no side pull. Includes 8" file.

\$9.95
PPD.

FREE LITERATURE



"TRU-CIRCLE"

saw set automatically sets teeth at 10° **\$2.95** or more.

PPD. MONEY BACK GUARANTEE

A. D. McBURNEY, 1610 Victory Blvd., Glendale, Calif. 91201, Dept. A-115

FREE!

Learn how you can buy used engines \$15 up, new engines \$30 with FREE confidential list and coupons when you order your plans

- **BUILD THIS MINI-BIKE!**
Plans reveal step by step details!
- **BUILD A RACING KART!**
Complete frame for less than \$10!



RUSH \$2 for plans (indicate type) or send 25¢ for brochure describing plans: PLANS, Box 478, Dept. PM11, Denver, Colo.

sit-down shopping

Learn how to sit back and order gifts by mail. The nicest—and smartest—people buy everything from low cost Christmas tree novelties to costly prestige gifts in November House Beautiful's big "Window Shopping" Mail Order section. Get the next House Beautiful, on newsstands about October 20.

WINDOW SHOPPING
the Mail Order pages of
House Beautiful

QUICK-WEDGE[®]

SCREW-HOLDING
SCREWDRIVER



**NEW
4-PACK
with
FREE RACK**
\$5.95

Perfect gift for the Craftsman!

A set of 4 Quick-Wedge Screw-Holding Screwdrivers* (The Screwdriver used by professionals to hold, start and drive the screw... anywhere... without fumbling.) **Plus FREE:** an aluminum screwdriver rack. A \$6.80 value. Screwdrivers unconditionally guaranteed. Now at Dealers or write. (Send cash with direct factory orders and save costly C.O.D. and postage costs.)

*Will handle all screw sizes in general use.

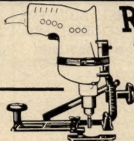


KEDMAN COMPANY, P.O. Box 267, Salt Lake City, Utah 84110

**REPAIR ANYTHING
BUILD ANYTHING**

STICKS LIKE A
Leech
CEMENTS • GLUES • ADHESIVES

ALL-PURPOSE GLUE KIT \$1.00
YOU SAVE 27¢. CONTAINS ADHESIVES FOR WOOD, PAPER, FABRICS, GLASS, LEATHER, POTTERY, ETC. SEND DEALER'S NAME, ADDRESS.
LEECH PRODUCTS, INC., HUTCHINSON, KANSAS



ROUTERMATIC
MAKES EVERY MAN
AN EXPERT
WOODWORKER

Clamp this amazing tool to your electric drill and route, mortise, trim, shape, mitre and tenon like a professional cabinetmaker. Handles any job better by

letting you take the tool to the work. Just like having an electric chisel. Routermatic is precision made, sturdy, lightweight. Use it once and you'll wonder how you ever got along without it. **ONLY \$6.95** including \$1.50 router bit. No C.O.D.'s. Can't be sold thru stores at this low price. Descriptive folder on request.

COMP-TOOL, Inc. 355 Prospect Rd., Ashtabula, Ohio

Sure beats smoking!



Enjoy Copenhagen: Place a small pinch between cheek and gum. No chewing.

United States Tobacco Company

KEEP PANTS IN

Snow Out, Feet Warm with New Kit of rubber attachments for arctics, boots. Also new type arctics, boots on Free Trial. All shown in our

FREE! FOOT HEALTH MANUAL

KOMFORT KINGS, Denver, Pa. 17517

LOCKS PANTS IN!



SEALS SNOW OUT!

BUILD YOUR OWN CAMPER AND SAVE!

ALSO TRAILER OR PICKUP-COVER

Complete, easy to follow plans. \$3.95 ea.

Instructions, material list...

Bus Conversion and Houseboat

interiors drawings. \$2.95

EQUIPMENT CATALOG—\$1.00

(Refundable on first order)

Satisfaction Guaranteed! Send Check Or M.O.—For Details Send Dime.

VIKING CAMPER SUPPLY

94-B Glenwood Av., Minneapolis 3, Minn.



Print Your Own

Cards, Stationery, Advertising, Circulars, labels, photo and movie titles, church work, tags, etc. Save money. Sold direct from factory only. Raised printing like engraving, too.

Own a Printing Business

Print for Others, Good Profit. Have home shop. Junior press \$15; Senior \$35 up. We supply everything. Easy rules. Pays for itself in short time. Write now for free details.

KELSEY PRESSES, Z-37 Meriden, Conn.

GET ACQUAINTED OFFER

SCREW SALE

FOR HOBBYISTS-BUILDERS and DO-IT YOURSELVERS

FLAT HEAD STEEL WOOD SCREWS
ZINC PLATED * PRICED PER GROSS

1 X #850	1 X #865
1 X #660	1 X #880
1 X #870	1 X #890
1 X #760	1 X #1075
1 X #775	1 X #1090
1 X #790	1 X #1081

MINIMUM ORDER \$3

POSTAGE PREPAID

WRITE FOR COMPLETE LIST OF ALL BOLT & SCREW SIZES, KINDS, FINISHES

SEND CHECK OR MONEY ORDER TO

GENERAL BOLT & SCREW CORP.

3905 WESTERN RD. FLINT, MICHIGAN 48506

SORRY NO C.O.D.'S

Transportation's Missing Link

(Continued from page 87)

and the like simply do not appeal to comfort-loving Americans.

The lack of appeal is especially true in major cities where there's a wide range of temperature and there's much rain and snow. As it happens, most of our large cities fit this description.

In addition, the rider of the small vehicle is intimidated by the behemoths that share the road with him. The solution to this problem is to have protected right-of-ways separate from automobile traffic. The eventual solution must be to separate completely the cars from local pedestrian and personal vehicle transportation. This has been done in many cities of Europe where there are three separate traffic lanes: pedestrian, cycle and auto.

The ultimate answer to the urban transportation problem—in terms of safety, economy, speed and land use—is to have high-speed mass transit to carry the very small personal vehicles that riders use for short trips to and from terminals. Already such plans are being proposed to deal with the aggravating traffic problems now upon us.

Several Institute of Design students have tried their skill at designing vehicles of this sort.

Sparky Is a Hitch Hiker

Sparky, for instance, is an electrically powered runabout that's fitted with a smoothly contoured aluminum body (photos, pages 86-87). It can travel 30 mph, and goes 60 miles on one charge of its batteries. Granted, it's a rather modest performance compared to a gasoline-powered car, but Sparky was conceived as a systems car to be shipped at distances over 25 miles by special high-speed rail transportation.

Another piggyback people-carrier is the Power Chair, which is simply a seat on wheels (photo, page 85). It travels up to 45 mph powered by a 4½-hp four-cycle engine.

After carrying a commuter to his train, then being transported into the city, the Power Chair could be driven to the office. Student Douglas Stout designed it.

But, even with all this thought going into design of small cars, how do you get Americans to accept them? We talk of speed, comfort and safety when we defend big cars, but it's primarily for the symbolism that Americans want their cars to be as big as possible.

Small cars seem to be less acceptable to Americans because of a common fallacy

(Please turn to page 256)

LEARN MEAT CUTTING AT NATIONAL Pay After Graduation

The steady dependable trade of Meat Cutting taught easily in 8 short weeks. YOU LEARN BY DOING under actual meat market conditions in big modern school at Toledo.

For beginners or men with experience. Get a profitable store of your own. Remember, PEOPLE MUST EAT! Big pay jobs. Free employment help. Thousands of successful graduates.

Buying, cutting, percentage, pricing, advertising, selling, etc. A complete retail meat education. National School established 42 years. Get National training now. Pay your tuition in easy monthly payments after you graduate. Send coupon for FREE 40 page school catalog—TODAY. G.I. approved.

National School of Meat Cutting, Inc., Dept. 50-A, Toledo 4, Ohio

Send me your FREE school catalog on National Training at Toledo in Meat Cutting, Meat Merchandising and Self-Service Meats. No obligation. No salesman will call.

Name _____ Age _____

Address _____

City _____ State _____
Approved for Veterans

**SAVE
UP TO 85%**

**GOV'T SURPLUS
and NEW EQUIP'T**

Send 25c For 3 Big Catalogs

**PUMPS
WELDERS
WINCHES
SURVEYING
TELEPHONES
HYDRAULICS
GENERATORS**

**ELECTRONIC
BINOCULARS
GEAR MOTORS
COMPRESSORS
SPEED REDUCERS
WEED SPRAYING
MANY OTHERS**



SURPLUS CENTER Dept. PM-115 Lincoln, Nebraska

LEARN WELDING AT HOME WE SEND YOU A WELDER

A trade with a future—in demand everywhere. We have trained thousands—Men who earn up to \$4.50 an hour. Learn Arc, Heli-Arc and Gas Welding. We supply equipment that lets you earn while you learn. Practical lessons on brand new, industrial rated machines. Both arc and flame welding. On complete the equipment is yours. Set up your own shop or work in any shop on any job. Send today for full information.

AMERICAN INSTITUTE OF ENGINEERING & TECHNOLOGY
1131 W. Fullerton Parkway, Chicago, Illinois



FOX

YOUR OWN BIKE

\$119.50 to 179.50

Even Mom'll go for this one—costs less, runs for just pennies (nearly 100 miles on a gallon of gas). And it's American made! It's the popular CAMPUS BIKE!

Literature FREE • Parts Catalog \$1.00
Box 797PM • Janesville, Wis. 53546



**ITALIAN
SNUB NOSE
AUTOMATIC**

Identical duplicate in styling of automatic detective revolver. Fires 12—4.5 cal. blank cartridges in 10 seconds. Not a CO₂ or Pellet gun.

FREE—72 rounds of blank cartridges included. Perfect for sports, stage, etc. Illustrated gift carton.

FEDERAL 6652 N. Western/Chicago, Ill. 60645
Dept. GPM

**FREE
72 ROUNDS
OF BLANK
CARTRIDGES**

\$4.98

Request
**FREE
Catalog**



Learn how to become a GAME WARDEN

GOV'T HUNTER, FORESTER, WILDLIFE MANAGER

Exciting job openings now for qualified men who love outdoor work. Protect forests and wildlife—arrest violators! Good pay, security, prestige and authority for respected career Conservation Officers. Easy home-study plan! Send for FREE Fact BOOK, aptitude QUIZ, SUBSCRIPTION to Conservation magazine. State age.

NORTH AMERICAN SCHOOL OF CONSERVATION
941 N. Highland Ave., Dept. 17B Los Angeles, Calif. 90038



**LAN-LIN
HAND CLEANER**

Cleans Hands With or Without Water
Removes Grease, Grime, Stains,
Paint, Ink . . . Safely!

RUB ON—RINSE OR WIPE OFF

At Service Stations, Auto & Hardware Stores

Have Business of Your Own

Big Money REPAIRING SMALL ENGINES

Every community needs more repairmen! Record sales of outboard motors, power mowers and tools, other equipment with motors, increase need for skilled repairmen. Excellent opportunity for full time or sparetime business of your own!



Learn at Home—Easy Course!

No need to quit present job. You learn fast the Gale Institute way, a leader in the field of technical instruction for nearly a quarter of a century. Write today—no obligation—find out how you can learn at home—the easy way—and about our easy payment plan. No salesman will call!



GALE INSTITUTE
Mpls., Minn. 55408

Gale Institute Room 1111-5
3006 Hennepin Ave., Mpls., Minn. 55408

Please send complete information on Small Engine Course.

Name _____

Address _____

City _____

State, Zip Code _____



Join
The
Jet
Set
Super
Agent

PETER TREES

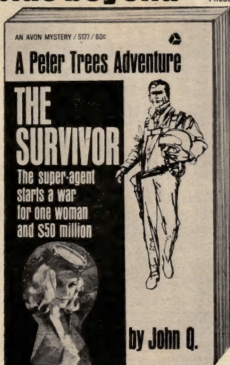
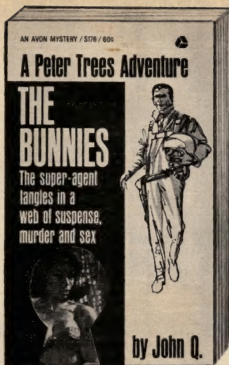
"The James Bond of the blue beyond"



FROM
AVON

60¢

At your
bookseller
or write
Dept. PM AVON BOOKS—959 8th Ave., New York 10019.
Please add 10¢ per book for postage and handling.



Transportation's Missing Link

(Continued from page 254)

that they are cheap cars. There have been a few small American cars that were well made. The automobile is designed to cater to the symbolic fantasies of prestige, opulence, comfort, youth, speed and so on held by the individual buyer. Designing is done in utter disregard of the total transportation system.

It is certainly not size nor weight that makes for good performance. The most roadworthy cars are the smaller ones. Comfort is not a function of size.

Two big forces will change people's attitudes toward accepting innovations in personal vehicles. The first is the steadily increasing use of malls. Most new shopping centers are being planned around pedestrian areas; the automobile must be left outside. Many major cities are proposing mall plans for the downtown areas in cities. This will change transportation systems as these plans grow.

The second force is the rapid growth of automobile rentals. All three major automobile manufacturers now have rental plans. As the idea grows, it will undoubtedly break down the symbolism of the car as a personal possession. The result should open the whole subject of vehicle design as applied to personal transportation.

Dismay or Delight

Whenever the vehicles built by the Institute of Design students are shown, the responses are both of dismay and delight. Those who don't like the machines find them crude and uncomfortable. Those who find them interesting and fun, compare them with sporting devices such as surfboards, karts and skis; in short, the fun is back in transportation.

Our transportation networks are very crude. All the pressures of a fast-developing urban civilization will force changes. Perhaps the vehicles shown on these pages are a hint of the answer.

Fast Photos

A device used for making photographs at the rate of 100 million frames a second—about 10 times faster than any previously made for industrial studies—is in use at the Army's Aberdeen Proving Ground. It is used for recording shock and detonation waves in the study of explosives. These waves move at a velocity of 8000 meters a second, or roughly 18,000 miles per hour. The ultra-high speeds are obtained by using a framing grid and rotating mirror.